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RECORDS AND DESCRIPTIONS OF CUBAN PSOCOPTERA

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Abstract: The number of species of Psocoptera recorded from Cuba is raised from ten to 65. Of these, 26 are described as new. Types of species previously described from Cuba were reexamined and redescribed where necessary. Two new genera are erected, *Pseudarchipsocus* (Archipsocidae, type *P. guajiro* new species), and *Indiopsocus* (Psocidae, type *I. texanus* [Banks]). Three major biogeographic categories are present in the Cuban psocid fauna: endemics, Caribbean species, and waifs. In the present state of knowledge, endemics include the largest number of species and waifs the fewest.

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INTRODUCTION

Although several papers in recent years have dealt with Psocoptera from Florida (Mockford, 1953, 1955, 1957a, 1961, 1962, 1963, 1965b, 1966, 1969a, 1971, 1972, Sommerman, 1956), Texas (Mockford and Gurney, 1956, Sommerman, 1957), Mexico, and Central America (Mockford, 1957b, 1959, 1965a, b, c, 1966, 1967, 1969a, b, 1971, Mockford and Wong, 1969) very little has yet been written about Psocoptera of the Caribbean Islands.

A few descriptions of Antillean species are found in the works on 'Neuropteroids' of Hagen (1861, 1865) and Banks (1908, 1924, 1930, 1938, 1941). Enderlein's (1919) work on psocids in the collections of Selys Longchamps contains a description of one Antillean species. More recently, in dealing with particular taxa of psocids, I have described a few Antillean species (Mockford, 1955, 1966, 1967, 1969a, 1971).

To date, there are literature records of only ten species of Psocoptera from Cuba. Accordingly, it was with great interest that I received for study two collections of Cuban psocids. The first of these was made by Dr. Milton Sanderson, who collected in Cuba in 1959. Dr. Sanderson was accompanied and guided by Ing. Fernando de Zayas of Havana. From 1963 to 1967, Ing. de Zayas made several collecting trips. His material was sent to Dr. Sanderson, who received it late in 1969, and sent the psocids to me at that time. Material of two species from a light trap at the U. S. Naval Base, Guantanamo Bay, was received from the Florida Department of Agriculture.

The material of these collections contains 61 species. Four species already described from Cuba are not in the material, so that the Cuban psocid fauna is raised to 65 species. Of these, 28 species are new to science, or probably so, and 26 are here named and described. The Banks and Hagen types of Cuban psocids were examined, and redescriptions of these species are included. Types of the species described as new are for the present retained in my collection.

A diagnosis is included for each species determined with certainty. Redescriptions are not given for species that have already been described adequately, but literature citations of descriptions which I regard as adequate are given in these cases. For species originally described from the Old World and first recorded here from the New World, I have included notes comparing the Cuban material with descriptions of Old World material. I also include notes on extra-Cuban distributions of the species in this paper where such information is available.

Synonymies, where brief, are listed in full. In the case of lengthy synonymies, I have cited the original name and a recent reference to the complete synonymy. Smithers' catalog (1967) is the reference cited for complete synonymies except in cases where it is no longer up to date.

Measurements, except where they seem critical for identification, were restricted to a representative individual of each sex. Where individuals of new species were on hand from geographic areas outside of Cuba, a single individual of each sex from each such area was measured. Measurements of appendages and appendage parts are for one side of the body only. Measurements recorded as whole numbers are in microns, while those recorded as decimals are in millimeters. The following abbreviations were used for parts measured.

S, P = length of scape and pedicel respectively
f_1, f_2, etc. = length of first flagellomere, etc.
IO = smallest width of head between compound eyes
H = greatest width of head
D = greatest anteroposterior compound eye diameter in dorsal view of head
d = greatest lateral compound eye diameter in dorsal view of head
PO = d/D
FW = length of forewing
FWw = greatest width of forewing
F = length of posterior femur
f = greatest width of posterior femur
T = length of posterior tibia
t_1, t_2, etc. = length of first posterior tarsomere, etc.
$t_1$ct = number of ctenidia on first posterior tarsomere
S_1 = length of humeral seta, longest lateral seta on pronotum
Sa = length of longest dorsolateral seta of ninth abdominal tergum
Se = length of longest seta on epiproct

Records include all data presented with the specimens. Since Dr. Sanderson and Ing. de Zayas have done nearly all of the collecting, their names are abbreviated (M.W.S. and F.Z.) in the records.

The classification followed at the familial level and above is essentially that of Badonnel (1951).

SYSTEMATIC SECTION

FAMILY LEPIDOPSOCIDAE ENDERLEIN

SUBFAMILY PERIENTOMINAE ENDERLEIN

Proentomum personatum Badonnel.

P. personatum Badonnel, 1949a, p. 23.

DIAGNOSIS: Differing from other members of its subfamily by possession in forewing of segment of Sc rejoining R_1 before base of pterostigma, and by possessing frontal 'moustache' marks (Badonnel, 1949a, fig. 2).

This species was adequately described by Badonnel (1949a). The same author (1969) described several differences between the Ivory Coast type specimens and a specimen from Angola. Principal among these were width of the moustache marks and whether M_1 and M_2 of the hindwing arise from a common stem or separately. He concluded that the differences fall within the limits of a species. It is notable that all adult specimens on hand from the American Tropics (63 specimens) agree with the Angolan specimen in having wide moustache marks. All but one agree with this specimen in having M_1 and M_2 of the hindwing arising separately. The exception has these veins united basally in one wing and separate in the other.

Measurements of Cuban specimens are tabulated below.

f_1	f_2	FW	T	t_1	t_2	t_3
128	107	2.24	1049	419	75	83
115	110	2.18	1036	404	83	76

Cuban specimens are slightly smaller in flagellar measurements and slightly larger in leg measurements than the single measured type specimen. The only serious discrepancy is in posterior t_3, for which I suspect that Badonnel's figure may be in error as it is approximately equal to my figures for $t_2 + t_3$.

In addition to the Cuban records, I have Western Hemisphere records from southern Mexico, British Honduras, Guatemala, Panama, French Guiana, Brazil, Jamaica, Puerto Rico, and St. Thomas, Virgin Islands. All known adults are females, suggesting parthenogenesis.

RECORDS: Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, 1 ♀, M.W.S. Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, 1 ♀, M.W.S.

SUBFAMILY THYLACELLINAE ROESLER

Thylacella cubana (Banks), new combination

Echmepteryx cubana Banks, 1941, p. 393.

DIAGNOSIS: The only known New World species of its genus. Differing from described females of Madagascan species by possession of well sclerotized second valvula of gonapophyses. Differing from *T. immaculata* Badonnel (Angola) by possessing transverse color bands on forewing and by having second valvula much shorter. Differing from *T. fasciata* Badonnel (Angola) in having basal transverse band of forewing complete across wing.

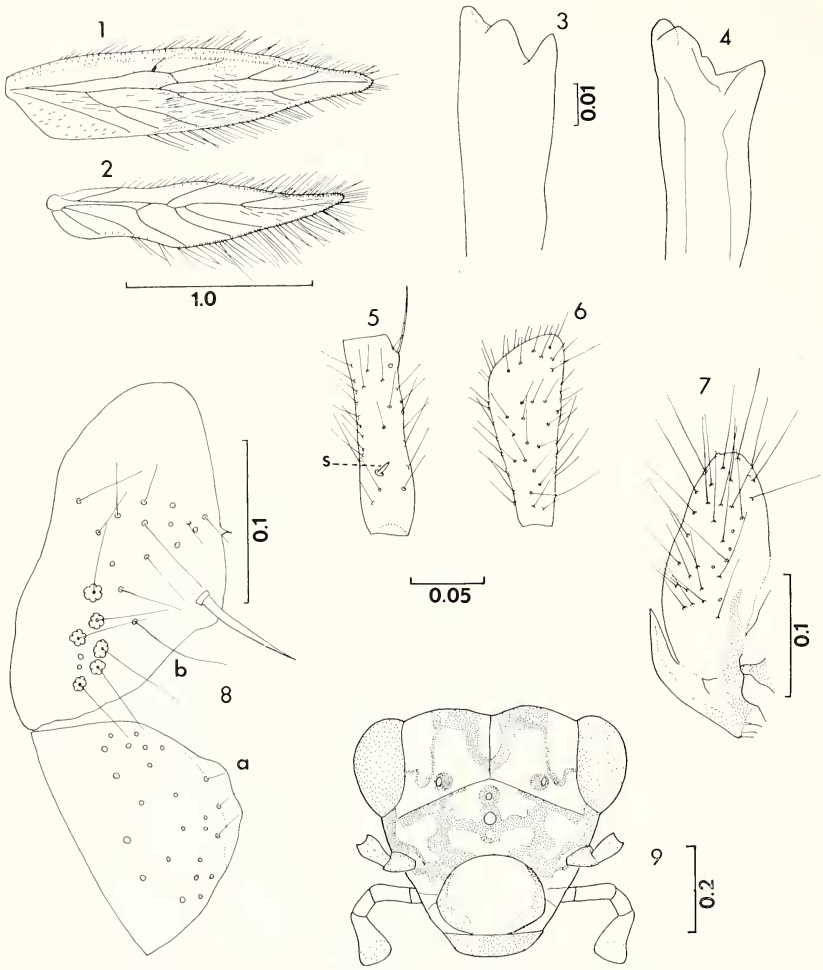
REDESCRIPTION: Female. Measurements (of paratype).

FW	T	t_1	t_2	t_3
1.87	0.82	0.33	70	62

MORPHOLOGY: Median ocellus somewhat smaller than laterals. Lacinial tip (figs. 3, 4) distinctly tridentate in Cuban material, quadridentate with very small middle denticle in mainland material. Maxillary palpus: sensillum of second segment (fig. 5) slender and acuminate; terminal segment (fig. 6) long, hatchet-shaped. Pretarsal claws typical of most species of genus—with two minute denticles, one near middle and one near apex; pulvillus relatively broad for this genus; a slender, straight seta at base of claw. Forewing (fig. 1) in general typical of the genus; first Rs segment absent in paratype, present in other specimens; distal Sc segment curved distally; IA faintly visible or not. In hindwing (fig. 2) R_{4+5} reaching wing margin posterior to apex; M_1 and M_2 arising separately from Rs. Gonapophyses (fig. 7) sclerotized at base. Sheath of spermathecal duct of about same length as third valvula of gonapophyses. Epiproct and paraproct as in figures 8a, b.

COLOR (in alcohol): Body generally dull yellow. Compound eyes black; ocellar pigment spots dark brown. A pale brown spot bordering each eye and another extending from median ocellus forward to frontoclypeal suture. Reddish brown band of each side of head continuing on each thoracic pleuron above leg bases to base of abdomen. Legs and antennae pale brown. Transverse bands of forewing each running from wing margin to wing margin as follows: first from base of pterostigma through distal end of areola postica; second from middle of cell R_1 through distal end of cell M_3; third from distal end of cell R_3 through cell M_1 distad of junction of vein M_2 with wing margin. Hindwings unmarked. Clunium and abdominal tip including sclerotized portions of gonapophyses dark reddish brown.

TYPE MATERIAL: Las Villas Prov.: Soledad, 9-15-VI-1939, C. T. Parsons collector. Holotype ♀ and 2 ♀ paratypes, number 25286 in Museum of Comparative Zoology, Cambridge, Massachusetts.



FIGS. 1–9. Structures of Cuban Lepidopsocidae. Figs. 1–8. *Thylacella cubana* (Banks) ♀. Fig. 1. Paratype, forewing. Fig. 2. Paratype, hindwing. Fig. 3. Paratype, lacinial tip. Fig. 4. Mexican specimen, lacinial tip. Fig. 5. Paratype, second segment of maxillary palpus (S = sensillum). Fig. 6. Paratype, distal segment of maxillary palpus. Fig. 7. Specimen from Texas, gonapophyses. Fig. 8. Paratype, a. epiproct, b. paraproct. Fig. 9. *Echmepteryx hageni* complex sp. ♀, front view of head. Scales in mm.

DISCUSSION: Outside of Cuba the species occurs on the Florida Peninsula from the Gainesville region southward and on the western side of the Gulf of Mexico from Brownsville, Texas south through eastern Mexico to Guatemala. Of the 132 adult specimens examined, all are females; this strongly suggests parthenogenesis. Since it is the only known New World species of its genus, it may have been introduced from Africa.

SUBFAMILY LEPIDOPSOCINAE ENDERLEIN

Echmepteryx (Echmepteryx) hageni complex species

DIAGNOSIS: Easily distinguishable from other Cuban Lepidopsocids by its facial pattern (fig. 9). Distinguishable from other members of its complex by details of this pattern.

I expect to treat this species in a later work dealing with the entire complex, which occurs throughout the Antilles and eastern North America.

RECORDS: Las Villas Prov.: Topes de Collantes, Sierra de Trinidad, June 11, 1959, 1 ♀, M.W.S. Oriente Prov.: Gran Piedra nr. Santiago, May 30–31, 1959, 2 ♀, M.W.S.; Loma del Gato, Sierra Maestra, May 26–28, 1959, 2 ♀, M.W.S. Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, 1 ♂, 4 ♀, M.W.S.

Echmepteryx (Thylacopsis) falco (Badonnel)

Thylacopsis falco Badonnel, 1949a, p. 24.
Echmepteryx falco (Badonnel): Smithers, 1967, p. 7.

DIAGNOSIS: Distinguishable from other members of its subgenus by its facial marking (Badonnel, 1949a, fig. 9).

This species was adequately described by Badonnel (1949a). It has been recorded in the literature only from the Ivory Coast and Madagascar. In addition to the Cuban record, the species is known in the Western Hemisphere from southern Mexico, Panama, French Guiana, Surinam, Guyana, Brazil, Trinidad (West Indies), Antigua (West Indies), and Puerto Rico. The 175 adult specimens on hand and the previously published records (8 specimens) are all females; thus parthenogenesis is strongly suggested.

Measurements of the Cuban specimen are as follows:

f_1	f_2	f_3	FW	FWw	T	t_1	t_2	t_3
38[1]	38[1]	40[1]	2.04	496	960	338	68	65

In general, the measurements agree closely with those given by

[1] abnormally shortened antenna.

Badonnel for one of the types from the Ivory Coast. The first and second tarsal segments are somewhat longer.

RECORD: Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, 1 ♀, M.W.S.

KEY TO THE SUBFAMILIES, GENERA, AND SUBGENERA OF CUBAN LEPIDOPSOCIDAE

1. Wings and body beset with numerous setae but without scales ..... Subfamily Thylacellinae
   Cuban genus, *Thylacella*, single Cuban species *T. cubana* (Banks)
   Wings and body clothed with scales 2
2. Antennae with at most 24 segments, each flagellar segment about four times as long as wide. In hindwing a closed basal cell present ..... Subfamily Perientominae (single Cuban genus *Proentomum*, single Cuban species *P. personatum* Badonnel)
   Antennae with 30 to 50 segments, each flagellar segment not more than twice as long as wide. In hindwing no closed basal cell ..... Subfamily Lepidopsocinae (single Cuban genus *Echmepteryx*) 3
3. Radial fork stem in forewing longer than R_{4+5} ..... *Echmepteryx* (*Thylacopsis*) (single Cuban species *E.* (*T.*) *falco* Badonnel)
   Radial fork stem in forewing equal to or shorter than R_{4+5} ..... *Echmepteryx* (*Echmepteryx*) (single Cuban species *E.* (*E.*) *hageni* complex species)

FAMILY PSYLLIPSOCIDAE ENDERLEIN

Psocatropos microps (Enderlein)

Axinopsocus microps Enderlein, 1903, p. 3. Complete synonymy in Smithers, 1967, p. 15.

DIAGNOSIS: Differing from *P. lachlani* Ribaga (Italy) by having distal segment of maxillary palpus long and slender. Differing from *P. pilipennis* (Enderlein) (India, Seychelles, Madagascar) by having M in forewing three-branched and having hypandrium much wider than long. Differences from other named species not known.

This species has been described adequately by Badonnel (1931, 1967). It is circumtropical and occurs frequently in houses on the walls. Both of the Cuban records are from this situation.

RECORDS: Habana Prov.: Vedado, Oct., 1965, 1 ♂, F. Z.; same locality, July 1966, 1 ♂, 1 ♀, 2 nymphs, F. Z.

FAMILY LIPOSCELIDAE ENDERLEIN

Liposcelis entomophilus (Enderlein)

Troctes entomophilus Enderlein, 1907, p. 34. Complete synonymy in Smithers, 1967, p. 25.

DIAGNOSIS: A species of Section I, Group A, Subgroup Ab of Badonnel (1962, 1963). Differing from other members of its subgroup by its particular dorsal abdominal color pattern (see key).

This species has been described adequately by Broadhead (1947b, 1950). It is cosmopolitan in distribution. It is frequently carried in human commerce and has been taken on the plumage of a live bird (Mockford, 1967).

RECORD: Habana Prov.: Vedado, July, 1966, 2 ♀, F. Z.

Liposcelis bostrychophilus Badonnel

L. bostrychophilus Badonnel, 1931, p. 250. Complete synonymy in Smithers, 1967, p. 24.

DIAGNOSIS: A species of Section II, Group D of Badonnel (1962, 1963), differing from *L. flavidus* Badonnel and *L. prenolepidis* Enderlein by its darker coloration; differing from *L. paetus* Pearman and *L. rugosus* Badonnel by possessing seven ocelloids in compound eye; differing from *L. subfuscus* Broadhead by its much shorter pronotal humeral setae.

This species has been described adequately by Broadhead (1947a, 1950) and Broadhead and Hobby (1944). It is cosmopolitan in distribution and is parthenogenetic, males being unknown. It is frequently encountered in domestic situations and is often carried in human commerce.

RECORD: Habana Prov.: Vedado, no date, in insect collection, 2 ♀, F. Z.

Liposcelis species

A single male represents a species other than the above two but cannot be identified.

RECORD: Habana Prov.: Vedado, no date, in insect collection, F. Z.

Embidopsocus laticeps Mockford

E. laticeps Mockford, 1963, p. 33.

DIAGNOSIS: A member of Group I, Subgroup b of Badonnel (1955). Very similar to *E. machodoi* Badonnel and *E. pauliani* Badonnel (West Africa) but differing from both in details of shape of spermapore sclerite. Differing from *E. luteus* (Hagen) as described under that species.

The species was described adequately by Mockford (1963). It is known from scattered localities throughout the state of Florida and from a single locality in southern Illinois.

The single lot of Cuban material consists entirely of macropterous females. Measurements for ten of these, representing all specimens in suitable condition for measurement, are summarized below.

	FW	H	f_1	f_2	f_3	F	f	T
Number	10	10	9	9	9	10	10	10
Minimum	1365	400	107	106	100	468	151	333
Maximum	1579	455	135	137	127	526	180	369
Mean	1448	431	119	118	116	497	165	346
Std. deviation	43.4	17.3	9.9	11.3	9.8	18.3	8.8	12.4

	t_1	t_2	t_3	S_1	S_a	S_e
Number	10	10	10	7	9	7
Minimum	77	39	51	50	138	68
Maximum	94	51	66	64	170	89
Mean	84	43	62	55	164	83
Std. deviation	5.2	3.5	4.8	4.6	12.4	8.4

Floridian specimens fall within or overlap the ranges of measurements shown by Cuban material except in F and t_1. In both of these, Florida material is smaller. Although this species is very similar to the next one, several differences were noted (see under *E. luteus* Hagen) which appear to be constant.

RECORD: Oriente Prov.: Florida Blanca nr. Alto Songo, May 23, 1959, under bark of fence, M.W.S., 12 ♀ macropterous.

Embidopsocus luteus Hagen

E. luteus Hagen, 1865, p. 6.
E. reticulatus Badonnel, 1972, p. 1106.

DIAGNOSIS: A species of Group I, Subgroup b of Badonnel (1955). Very similar to *E. laticeps* Mockford, differing as indicated in redescription.

REDESCRIPTION (based on one of two cotypes, both macropterous females; the specimen used for the redescription was designated lectotype): Measurements:

FW	H	f_1	f_2	f_3	F	f
1.52	0.42	0.131	0.134	—	0.52	0.171

T	t_1	t_2	t_3	S_1	S_a	S_e
0.36	0.081	0.045	0.046	0.048	0.142	—

MORPHOLOGY: Head and thoracic terga of usual form for macropterous individuals of the genus. Pretarsal claw (fig. 14) with six

denticles along its ventral surface, the preapical two largest. Forewing (fig. 10) with two principal longitudinal veins fading in about distal third of wing, disappearing in about distal sixth. Anterior longitudinal vein sending stout branch to wing margin at about half its length. Hindwing (fig. 11) with only slight indications of veins. Transverse sclerotized strips of abdominal terga 4 to 6 only very slightly flexuous (fig. 12).

COLOR: Not noted except forewing membrane apparently uniformly clear.

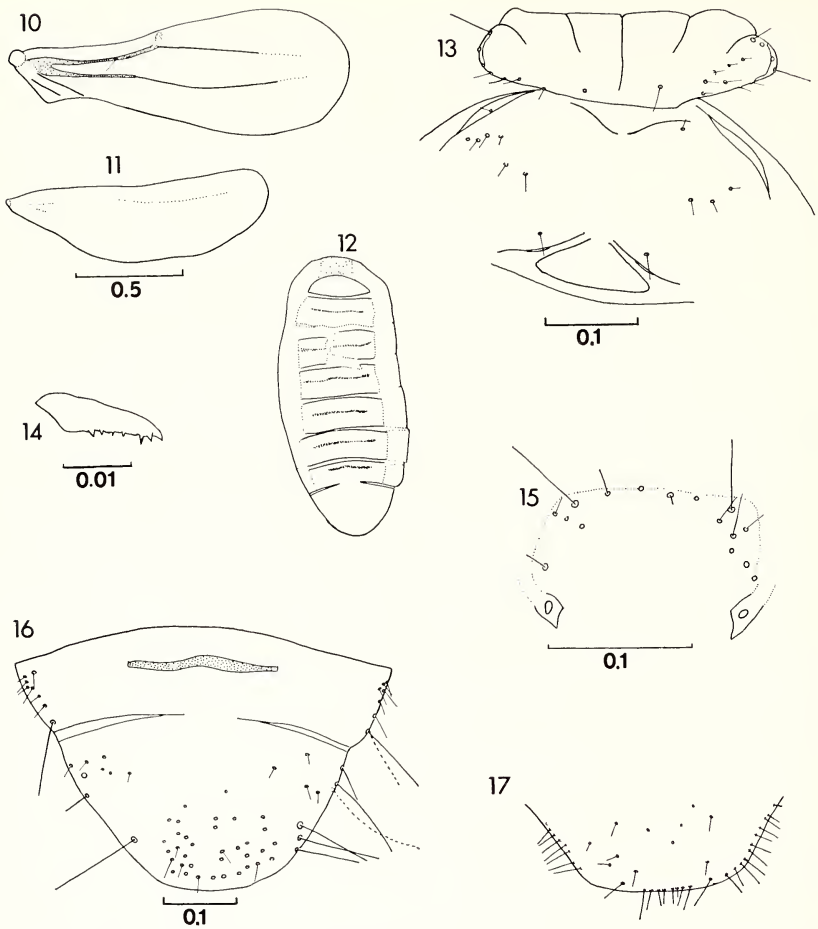
CHAETOTAXY: Lateral lobes of pronotum (fig. 13) each with long humeral seta, one or two setae as long as or longer than humeral seta in front of it; several short setae scattered over surface. Prosternum (fig. 15) with long seta near each anterolateral corner, several shorter setae scattered along its anterior and lateral edges. Chaetotaxy of terminal abdominal terga as in figure 16, of subgenital plate as in figure 17.

SCULPTURE OF INTEGUMENT: Head as described for *E. laticeps* (Mockford, 1963:35). Sculpture not observed on abdominal terga.

TYPE MATERIAL: Cuba (Gundlach), no date. Lectotype macropterous ♀ on slide, paralectotype macropterous ♀ glued on paper, in Museum of Comparative Zoology, Cambridge, Massachusetts. Both bear type number 186.

DISCUSSION: The lectotype differs from the series of *E. laticeps* examined as follows: 1) The compound eye diameter is approximately 125μ versus 106 to 114μ in *E. laticeps*; 2) the anterior vein of the forewing (fig. 10) has a distinct connection to the wing margin versus no connection or only an indistinct one in *E. laticeps*; 3) the middle pretarsal claw (fig. 14) has five distinct denticles before the preapical one, one of these large and set close to the preapical one, versus three denticles before the preapical one, none very close to it in *E. laticeps*; 4) the posterior tarsus has t_2 approximately 45μ versus 39μ to 42μ in *E. laticeps*, and t_3 is approximately 46μ versus 51μ to 64μ in *E. laticeps*; 5) the posterior margin of the subgenital plate has a row of eight setae flanked on each side by a space, the lateral two members of the row only slightly longer than the others, versus a row of six setae, the lateral two being much longer than the others in *E. laticeps*; 6) the transverse sclerotized strips of abdominal terga 4 to 6 are only slightly flexuous, versus decidedly flexuous in *E. laticeps* (Mockford, 1963, fig. 51).

Badonnel (1972) has noted the synonymy of his Brazilian species *E. reticulatus* with this one. Without reexamination of the lectotype, I am unable to confirm or refute his view but tentatively accept it.



FIGS. 10–17. Structures of *Embidopsocus luteus* Hagen, ♀ lectotype. Fig. 10. Forewing. Fig. 11. Hindwing. Fig. 12. Abdominal terga, scale of wings. Fig. 13. Prothoracic and mesothoracic terga. Fig. 14. Mesopretarsal claw. Fig. 15. Prothoracic sternum. Fig. 16. Abdominal terga VIII–X, dorsal surface. Fig. 17. Subgenital plate, scale of Fig. 13.

KEY TO THE SUBFAMILIES, GENERA AND SPECIES OF CUBAN LIPOSCELIDAE

1. Hind tibia with stout terminal spur. Winged forms with ocelli and many-faceted compound eyes. Wingless forms without ocelli and

with compound eyes of two facets. Hind femur lacking an external hump ..... Subfamily Embidopsocinae (single Cuban genus *Embidopsocus*) 2

Hind tibia without terminal spurs. Only wingless forms, lacking ocelli and with compound eyes of not over eight facets. Hind femur with an outer hump ..... Subfamily Liposcelinae (only one genus, *Liposcelis*) 3

2. Anterior vein of forewing with weak connection, if any, to anterior wing margin. Series of setae of posterior margin of subgenital plate with outer member of either side much longer than others ..... *E. laticeps* Mockford

Anterior vein of forewing with strong connection to wing margin. Series of setae of posterior margin of subgenital plate with outer member of either side only slightly longer than others ..... *E. luteus* (Hagen)

3. Abdominal terga 3 to 4 uniform in sclerotization and sculpture, not presenting posterior membranous band with sculpture different from anterior part 4

Abdomen with posterior parts of terga 3 to 7 membranous, membranous zones differing in sculpture from anterior sclerotized regions of these terga. Sclerotized regions of abdominal terga uniformly brown in color ..... *L. bostrychophilus* Badonnel

4. Color uniformly pale gray except for purple pigment granules ventrally in head and neck ..... *L.* species

Abdominal terga marked with broad bands of brown interrupted medially ..... *L. entomophilus* (Enderlein)

FAMILY PACHYTROCTIDAE PEARMAN

Tapinella aliena (Banks), new combination

Psylloneura aliena Banks, 1941, p. 393.

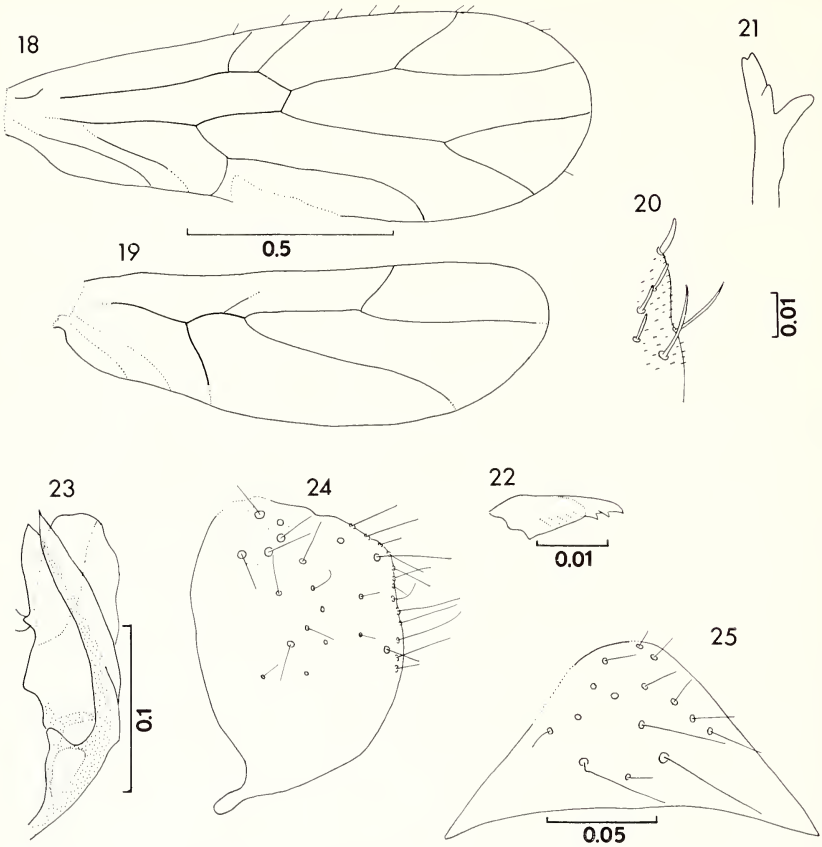
DIAGNOSIS: Differing from other described species of its genus by abdominal color pattern, described below, and by possession of two sizeable preapical denticles of pretarsal claw (fig. 22).

REDESCRIPTION (based on holotype and one paratype):

Macropterous female. Measurements (of paratype):

FW	T	t_1	t_2	t_3
1.35	0.54	0.29	0.062	0.056

MORPHOLOGY: Sensilla of terminal segment of maxillary palpus (fig. 20) four short rounded hairs arranged roughly in longitudinal row. Lacinial tip (fig. 21) with three prongs, the outer one bifid at tip. Pretarsal claw (fig. 22) with two large denticles in distal third, no denticles, but striations in basal two-thirds. Forewing (fig. 18) with basal portion of Sc present but not reaching wing margin; distal



FIGS. 18–25. Structures of *Tapinella aliena* (Banks), ♀ paratype. Fig. 18. Forewing. Fig. 19. Hindwing. Fig. 20. Sensilla of distal segment of maxillary palpus. Fig. 21. Lacinial tip, scale of Fig. 20. Fig. 22. Pretarsal claw. Fig. 23. Gonapophyses. Fig. 24. Paraproct, scale of Fig. 23. Fig. 25. Epiproct.

portion (basal closing vein of pterostigma) curved; R_{2+3} curved; vein Cu_{1a} parallel to wing margin most of its length. Hindwing with R_1 partially developed, arising from second segment of R + M. Gonapophyses (fig. 23) of usual form for the genus, second valvula acutely pointed apically. Paraproct (fig. 24) with sensory area of five setae arranged in a partial circle. Epiproct (fig. 25) bearing two long setae near its base and long one mesially; all other setae short, none stout.

COLOR: Compound eyes of dried specimen iridescent grayish green (holotype) or golden yellow (paratype). A red band from compound eye through antennal base to epistomal suture, continuing on clypeus as faint red lines or a red smudge. Head otherwise unmarked. Terminal segment of maxillary palpus dark brown posteriorly, paler anteriorly. Thorax marked laterally with reddish brown. Each preclunial abdominal segment marked with red band across tergum terminating laterally where reaching dark reddish brown longitudinal double stripe along each side. Wings uniformly tawny brown.

TYPE MATERIAL: Las Villas Prov.: Soledad, 24–30 May (C. T. Parsons). Holotype macropterous ♀ and one macropterous ♀ paratype. Both specimens bear number 25285 in the Museum of Comparative Zoology, Cambridge, Massachusetts.

DISCUSSION: The species is assigned to *Tapinella* as the hindwing (fig. 19) shows no trace of broadening in its middle.

Tapinella species

DIAGNOSIS: Similar in color pattern to *T. aliena*, but differing in lack of lateral longitudinal stripes of abdomen. Pretarsal claws with single sizeable preapical denticle preceded by series of minute denticles.

The single Cuban specimen is not adequate for a description of this species. Since most of the material on hand is Mexican and Guatemalan, I plan to describe it in a separate paper.

RECORD: Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, 1 ♀, M.W.S.

KEY TO THE CUBAN SPECIES OF TAPINELLA

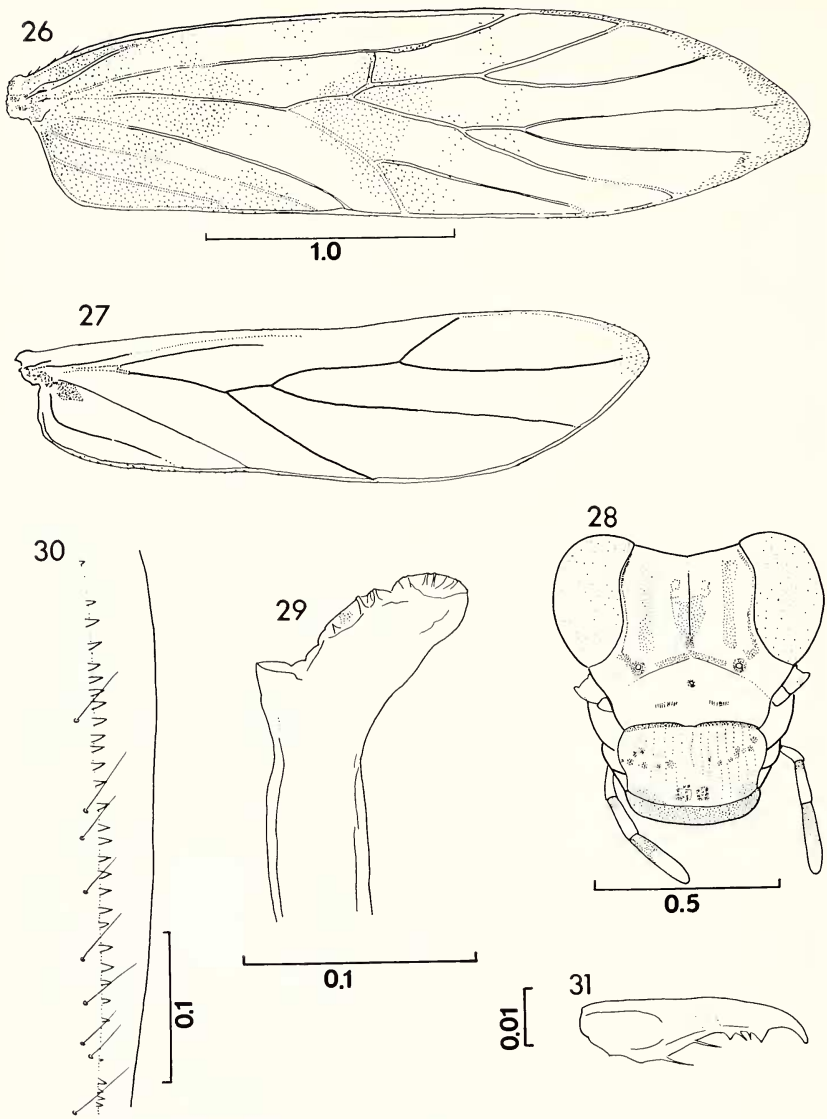
1. Pretarsal claw with two sizeable preapical denticles and no other denticles (fig. 22). Each side of abdomen marked with a longitudinal reddish brown double stripe ..... *T. aliena* (Banks)
   Pretarsal claw with a single sizeable preapical denticle preceded by several minute denticles. Sides of abdomen without longitudinal reddish brown stripes ..... *T.* species

FAMILY AMPHIENTOMIDAE ENDERLEIN

SUBFAMILY AMPHIENTOMINAE ENDERLEIN

Amphientomum hystrix, new species

DIAGNOSIS: Very similar to the Mexican fossil form *A. elongatum* Mockford, but differing primarily by more elongate, narrower distal third of forewing with proportionately narrower median cells.



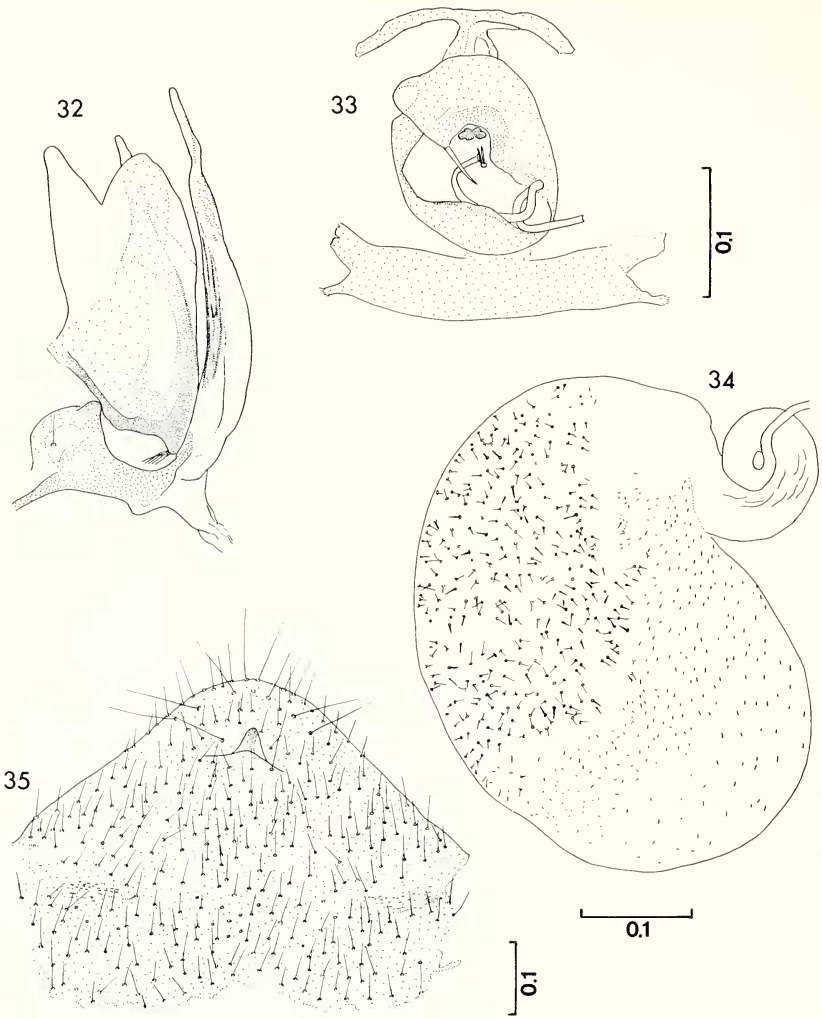
FIGS. 26–31. Structures of *Amphientomum hystrix*, new species ♀. Fig. 26. Forewing. Fig. 27. Hindwing. Fig. 28. Front view of head. Fig. 29. Lacinial tip. Fig. 30. Row of denticles of anterior femur. Fig. 31. Pretarsal claw.

Female. Measurements:

f_1	f_2	f_3	f_4	f_5	FW	T	t_1	t_2	t_3	$t_1$ct
312	308	314	246	180	3291	1213	917	120	128	40

MORPHOLOGY: Epicranial line pronounced, frontal lines vague except basally; vertex concave between compound eyes. Ocelli far apart, the laterals immediately above and touching each frontal line near each compound eye. Antennae 12 segmented, bearing sparse long setae in several irregular ranks. Lacinial tip (fig. 29)—lateral cusp bearing two ridges, an anterior and a posterior in normal orientation of lacinia; anterior ridge of low, irregular denticles; posterior ridge sharp, divided about halfway along its length; median cusp short. Forewing (fig. 26) elongate, slender, tapering toward apex, but apex rounded. Stem of Rs directed approximately anteroposteriorly; r-m crossvein nearly longitudinal. Rs fork stem about equal in length with R_{2+3}. Common stem of M_1 and M_2 relatively long; areola postica elongate and low. Cu_2 and IA not joining at wing margin; IA and IIA parallel for most of their lengths. Hindwing (fig. 27) shaped as forewing, lacking any trace of basal piece of Rs. Row of spines of first femur (fig. 30) extending from end of basal fourth of femur nearly to distal end, including 32 spines. Posterior tarsus with 39 ctenidia; first tarsomere with two strong spines at tip, second with one; pretarsal claw (fig. 31) bearing two setae in basal half, a few faint oblique striations in middle third, two distinct preapical denticles. Subgenital plate (fig. 35) with two long setae on middle of posterior margin, a submarginal arched row of 6 long setae; sclerite as in figure. Gonapophyses (fig. 32) of usual form for the genus. Spermapore sclerite (fig. 33) a complexly sclerotized ring bordered posteriorly (?) by narrow, somewhat curved sclerite connected to ring in its middle by short stem; bordered anteriorly (?) by slightly sclerotized band. Spermatheca (fig. 34) about half covered with minute spines and setae. Sense tubercle of paraproct with seven trichobothria.

COLOR (in alcohol): Compound eyes gray with faint transverse lines suggesting banding pattern in life. Ground color of head yellowish white; head marked (fig. 28) with spotty brown band bordering each compound eye and another bordering epicranial line. From anterior end of epicranial line a broad dark brown line running toward each compound eye and turning abruptly downward before reaching eye. Postclypeus with broad spotty brown band below its dorsal limit and three diffuse brown spots just above its ventral limit. Gena with diffuse brown spot behind antennal base. Antenna white basally, brown from third flagellomere outward. Thorax brown, palest around leg bases and notal sutures. Forelegs white except for following brown



FIGS. 32–35. Structures of *Amphientomum hystrix*, new species ♀. Fig. 32. Gonapophyses, scale of Fig. 33. Fig. 33. Sclerotizations around spermapore. Fig. 34. Spermatheca. Fig. 35. Subgenital plate.

marks: partial band on femur before distal end, basal and subapical band on tibia, basal band on first tarsomere, entire second and third tarsomeres. Middle and hindlegs same except coxae brown on both. Forewings (fig. 26) mostly clear with a few irregular brown blotches.

Hindwings unmarked. Abdomen with ground color white; a diffuse dark brown band along each side for its entire length, becoming most distinct in two preclunial segments; a narrow diffuse dark brown band along dorsal midline ending before clunium. Clunium and subgenital plate medium brown.

HOLOTYPE ♀ AND 2 ♀ PARATYPES: Matanzas Prov.: Mercedes, Dec., 1966, in Mamoncillo, F.Z.

Amphientomum species

A single specimen in very bad condition represents a distinct species. The vertex is slightly convex between the compound eyes. Bilaterally asymmetrical swellings on the middle and hind tibiae strongly suggest an anomalous condition, so that I decline to base a new species on this individual.

RECORD: Oriente Prov.: Yateras, June 1, 1959, 1 ♀ M.W.S.

FAMILY EPIPSOCIDAE PEARMAN

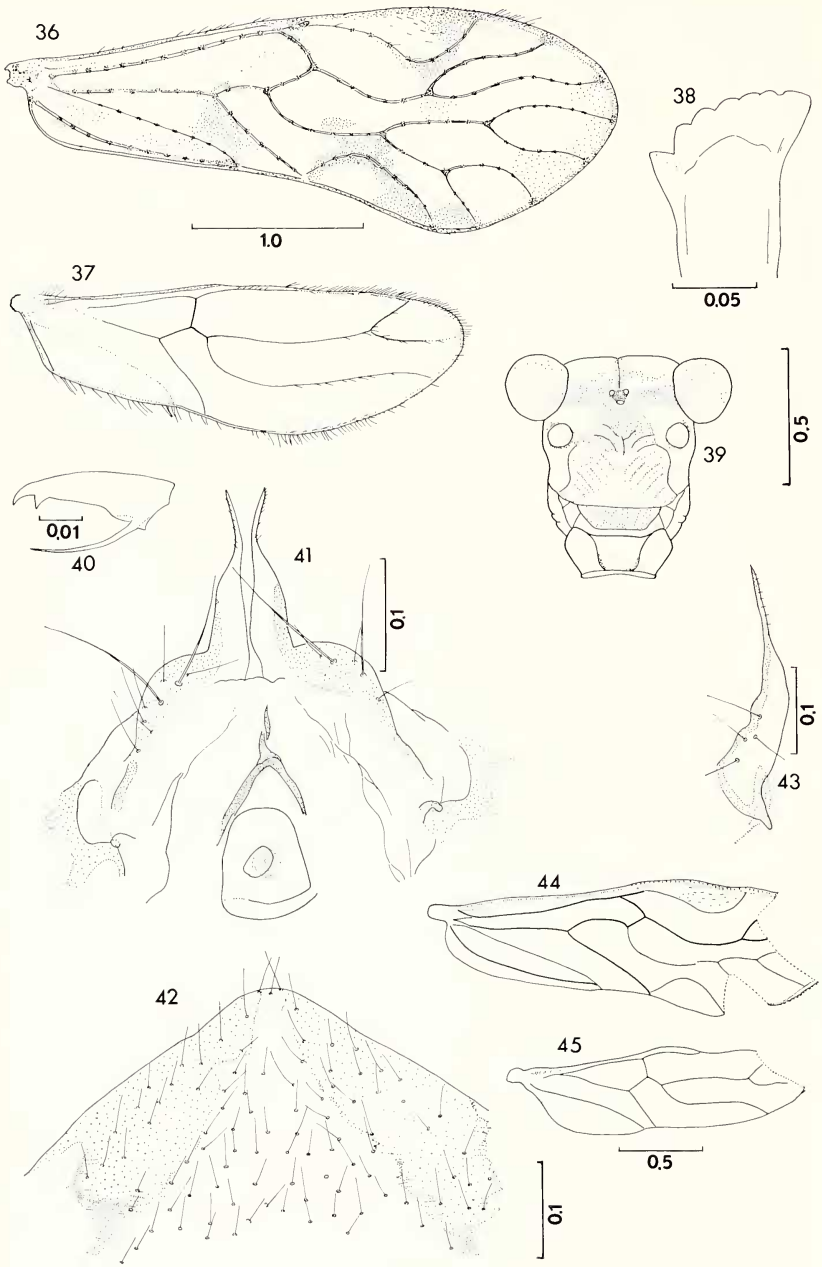
Epipsocus ornatus, new species

DIAGNOSIS: Very similar to *E. antillanus* Banks (Jamaica) and *E. icarus* Banks (Hispaniola), all having M of forewing dichotomously four-branched. Differing from *E. antillanus* in having brown spot at base of each seta on veins of forewing; differing from *E. icarus* in having band of distal margin of forewing completely lacking in cell M_3 and interrupted in cell M_1; areola postica in its distal half not so low.

Female. Measurements:

FW	T	t_1	t_2	$t_1$ct	$t_2$ct	IO	D	d	IO/D	PO
3612	1500	649	186	30	5	0.40	0.30	0.25	1.30	0.83

MORPHOLOGY: Epicranial line distinct, frontals absent. Dorsal margin of postclypeus faint, biconvex. A circular clear spot mesiad of each antennal base. Sclerotized transverse bars of labrum running completely across labrum and joined anteriorly by cross piece. Lacinial tip (fig. 38) broad and multidenticulate. Pretarsal claw as in figure 40. Subgenital plate (fig. 42) with free margin rounded, bearing three setae at apex; pigmentation weak except for two anterolateral dark spots (one each side) apparently marking thickening of cuticle. Gonapophyses (fig. 41): first valvula represented only by slight sclerotization in membrane mesiad of other valvulae; second and third valvulae fused together; second with elongate, slender, setulose tip; third valvula rounded laterally, bearing two long setae and seven shorter ones. Spermapore (fig. 41) surrounded by weakly sclerotized ring somewhat triangular in shape with apex posterior. Paraproct


36
1.0
38
0.05
37
39
0.5
0.01
40
41
0.1
43
0.1
44
42
45
0.5
0.1

with numerous long setae, mostly marginal, some very attenuated, slender much of their length; sense cushion bearing 20 and 21 trichobothria, some with only partially formed basal florets. Epiproct with three long, attenuated basal setae and numerous setae near tip, some attenuated.

COLOR (in alcohol): Antennal base dark brown, remainder of antenna paler brown. Compound eyes gray; ocellar interval dark brown. Background color in general yellowish white. Head marked as follows (fig. 39): mottled brown band along epicranial line; brown band across head between compound eyes running through ocellar interval anteriorly, delimited anteriorly along a line but fading and becoming mottled posteriorly; triangular brown spot on frons with its vertex on ocellar interval and its base in postclypeus. Diffuse dark brown band from compound eye through antennal base to brown frontal spot, crossing this spot under cuticle to become continuous with band of other side. Postclypeus striated with medium brown. Anteclypeus and labrum between its vertical bars medium brown. Thoracic pleura of each side with diffuse dark brown band running their length immediately above coxae, otherwise medium brown. Anterior mesonotal lobe mostly medium brown. Legs each with brown preapical band on femur, another on base of first tarsomere; second tarsomere dusky brown. Forewing (fig. 36) with pronounced brown spot at base of each seta, brown spot in distal end of pterostigma, another below posterior angle of pterostigma, another in areola postica and extending out anterior to it; brown band of distal wing margin from spot in areola postica extending around margin, with interruptions as noted in diagnosis, to vein R_{4+5}; brown spot in cell Cu_{1b} immediately beyond M-Cu separation; dark brown spot at nodulus. Hindwings (fig. 37) unmarked. Abdomen with broad brown band along each side continuing from thorax on segments 1 to 7, band continuous over tergum on first segment; segments 2 to 7 each with pair of brown spots dorsally; subgenital plate medium brown.

HOLOTYPE ♀: Oriente Prov.: Gran Piedra, June 1967, F.Z.

←

FIGS. 36–45. Structures of Cuban *Epipsocidae*. Figs. 36–42. *Epipsocus ornatus*, new species ♀. Fig. 36. Forewing. Fig. 37. Hindwing. Fig. 38. Lacinial tip. Fig. 39. Front view of head. Fig. 40. Anterior pretarsal claw. Fig. 41. Gonapophyses and ninth sternum. Fig. 42. Subgenital plate. Figs. 43–45. *Mesepipsocus mobilis* (Hagen), holotype ♀. Fig. 43. Gonapophyses. Fig. 44. Forewing. Fig. 45. Hindwing.

Mesepipsocus mobilis (Hagen), new combination

Psocus mobilis Hagen, 1861, p. 12.
Caecilius mobilis (Hagen): Hagen, 1866, p. 205.
Psocidus mobilis (Hagen): Smithers, 1967, p. 109.
Mesepipsocus grassei Badonnel, 1969, p. 79, **New Synonymy**.

DIAGNOSIS: Female gonapophyses (fig. 43) lacking first valvula (but holotype with bilaterally present fold in membrane at first valvular position). Differing from *Epipsocus s.l.* species with similar gonapophyses as follows: from *E. roncodarensis* New, *E. sinuatus* New, *E. taitubai* New, *E. obscurus* New, *E. brevistigma* New, *E. brasilianus* New, and *E. roesleri* New by lack of spots at ends of longitudinal veins of forewing; from *E. brunellus* New by macroptery.

The species was described adequately by Badonnel (1969) under the synonym *Mesepipsocus grassei.* I have made the following notes on the type.

Measurements:

FW	T	t_1	t_2
2.22	1.08	0.49	0.135

GENERAL FEATURES: Macropterous. Wings unmarked, with venation normal for *Epipsocus* (figs. 44, 45). Gonapophyses as in figure 43; second valvula with tip greatly attenuated, bearing a few minute spinelets; rudimentary third valvula represented by swelling on side of second valvula bearing four setae.

HOLOTYPE ♀: Cuba (von Winthem), no additional data, in Museum of Comparative Zoology, Cambridge, Massachusetts.

KEY TO THE CUBAN SPECIES OF EPIPSOCIDAE

1. Media of forewing dichotomously four-branched. Forewings with dark spots at bases of setae on veins and with several color marks in membrane ..... *Epipsocus ornatus*, new species
   Media of forewing three-branched. Forewing apparently unmarked ..... *E. mobilis* (Hagen)

FAMILY AMPHIPSOCIDAE PEARMAN

Dasydemella dezayasi, new species

DIAGNOSIS: Similar to *D. setosa* Roesler, differing in that only hairs in basal half of wing arising from brown spots, and brown border of pterostigma lacking. Head virtually unmarked.

Male. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
4374	1459	427	186	17	364	317	261	1.15	0.82

MORPHOLOGY: Lacinial tip (fig. 48) flat and broad with a few low denticles. Each tibia with a few small upright setae near its distal end scattered among larger setae set at angle. Pretarsal claw bearing wide pulvillus flaring at its tip; basally claw bearing long seta and two short ones. Free margin of hypandrium with setae scattered evenly along it. Posterior two abdominal vesicles present; anterior vesicle apparently absent. Phallosome (fig. 49) with broad parameres; anterior end of frame weakly sclerotized; posterior end acutely angular but blunt tipped. Hypandrium as in figure 50. Paraproct bearing prominent blade-like cone flanked by two long, stout setae (fig. 52) on free margin. Sense cushion of paraproct bearing 31 and 32 trichobothria on specimen examined.

COLOR (in alcohol): Body and appendages in general dull yellowish white. Compound eyes purple; ocellar interval dark brown. Head with faint pale brown band bordering each compound eye dorsally. Thoracic terga pale brown except around lateral margins and on midline. Abdomen with diffuse reddish brown band from base to clunium dorsolaterally on each side. Forewings (fig. 46) clear, brown spot at base of each seta in basal half of wing, and brown spot at base and at tip of pterostigma. Hindwings (fig. 47) unmarked.

HOLOTYPE ♂ AND 1 ♂ PARATYPE: Oriente Prov.: La Siberia, Sierra Maestra, June, 1967, F.Z.

Polypsocus fasciatus Banks

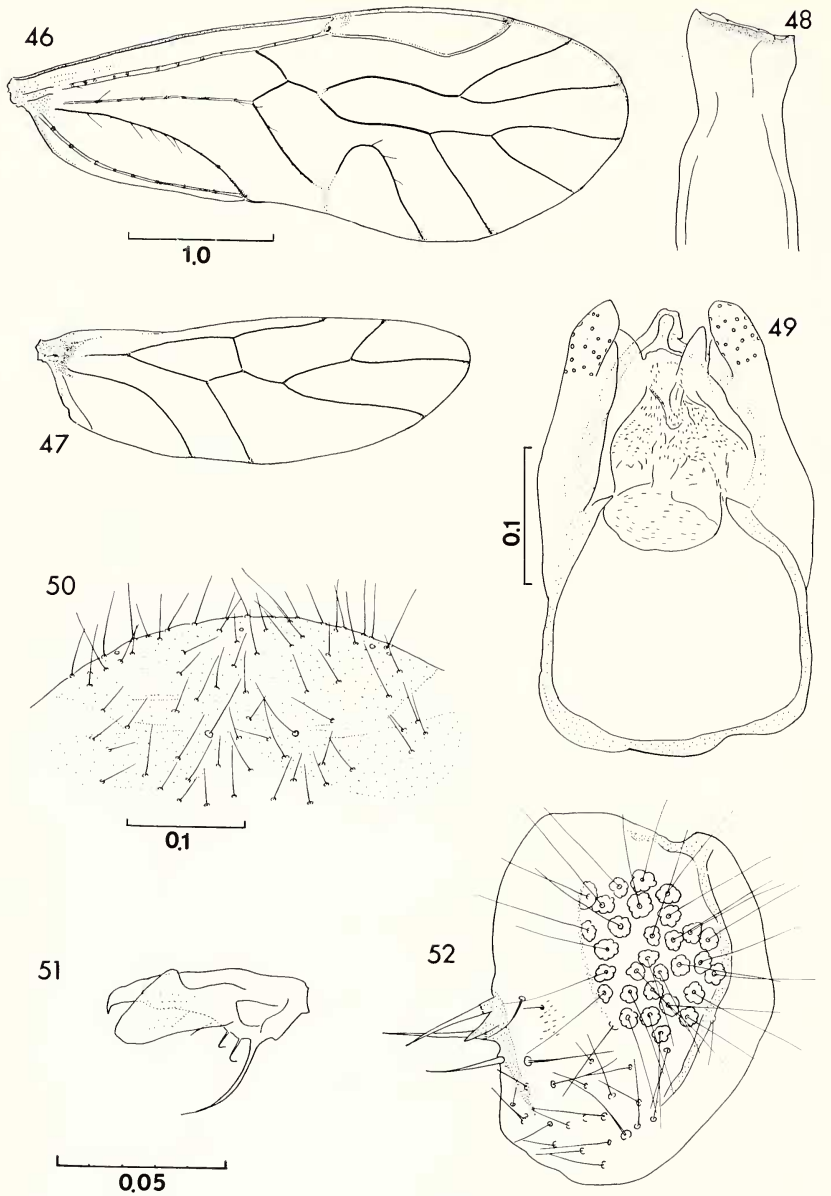
P. fasciatus Banks, 1908, p. 258.

DIAGNOSIS: The only species of its genus regularly showing accessory venation in cell R of forewing (figs. 53, 54).

REDESCRIPTION: Male. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
2600	949	345	121	19	236	300	239	0.79	0.80

MORPHOLOGY: Lacinial tip (fig. 57) with high median cusp scarcely separate from sloping lateral cusp. Epicranial line distinct to ocellar interval; frontal lines absent. Each pretarsal claw subtended by broad appendage flaring at tip; base of each claw ventrally with strong seta. In forewing an extra, incomplete transverse vein in cell R. Radial fork stem exceedingly short, branches of Rs about half length of forewing and flexuous. Areola postica about 2½ times as long as broad. Free margin of hypandrium (fig. 55) with rounded, protruding middle region flanked by several long setae on each side (five in the specimen on hand). Phallosome (fig. 56) rounded basally with slight corners on sides at base, with acute posterior end and



FIGS. 46–52. Structures of *Dasydemella dezayasi*, new species ♂. Fig. 46. Forewing. Fig. 47. Hindwing. Fig. 48. Lacinial tip, scale of Fig. 51. Fig. 49. Phallosome. Fig. 50. Hypandrium. Fig. 51. Pretarsal claw. Fig. 52. Paraproct, half scale of Fig. 51.

narrow parameres; endophallus with middle region divided and spinose; bearing two prominent lobes laterally. Sense cushion of paraproct with 22 to 24 trichobothria.

COLOR (in alcohol): Compound eyes black, ocellar interval dark brown. Vertex uniformly medium brown except for two slender bands of yellowish white converging toward ocellar interval. Remainder of head, antennae, thoracic pleura, legs, and abdomen yellowish white. Lateral mesonotal lobes medium brown outlined in yellowish white. Anterior mesonotal lobe pale brown. Remainder of thoracic terga yellowish white. Forewings marked as in figure 53; hindwings unmarked except for two faint brown spots in cell Cu_2 and faint brown wash along the posterior wing margin.

Female. Measurements (three individuals):

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3.49	0.92	0.29	0.10	18	0.53	0.25	0.20	2.15	0.81
3.46	1.20	0.40	0.13	18	0.51	0.24	0.17	2.12	0.73
3.44	1.15	0.38	0.13	23	0.47	0.23	0.18	2.04	0.80

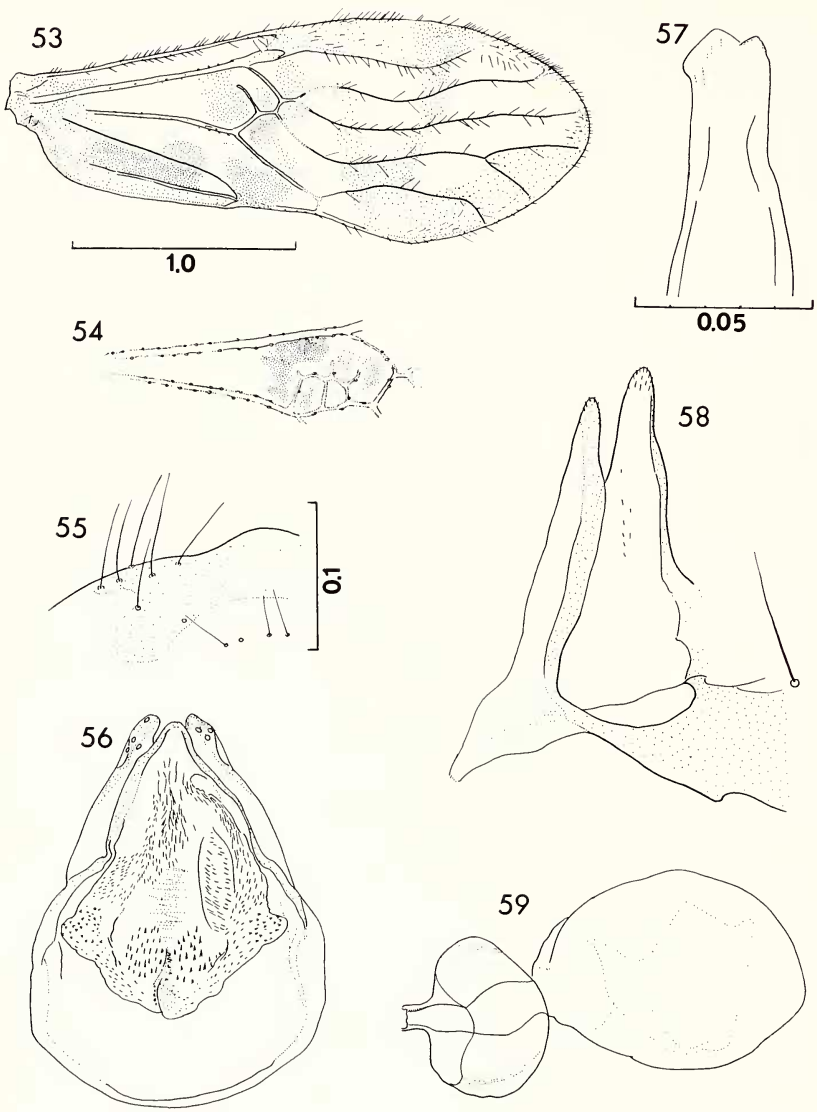
MORPHOLOGY: Mouthpart, leg, and wing characters same as in male, except in forewing of specimen examined several extra veins developed in cell R (fig. 54). Subgenital plate with pigmented area of two arms diverging anteriorly and strongly curved out at their apices. Free margin of plate with short median bare area flanked by long setae. Spermathecal gland broad and short, incompletely surrounding duct (fig. 59). Gonapophyses (fig. 58): first and second valvulae rounded and setulose apically; rudimentary third valvula absent. Sense cushion of paraproct with 23 trichobothria. Epiproct with peripheral arched row of ten long setae.

COLOR (in alcohol): Differing from male as follows: on each side a reddish brown band along propleuron bordering its dorsal edge, continuing on neck and on head, interrupted by compound eye, and continuing to antennal base. Vertex pale brown mottled with yellowish white. Abdomen red except pale brown on clunium, paraprocts, and base of epiproct; tip of epiproct red.

HOLOTYPE ♀: Cayamas, Cuba (Baker), in Museum of Comparative Zoology, Cambridge, Massachusetts.

RECORDS: Camagüey Prov.: Monte Imías nr. California, June 7, 1959, 1 ♂, 1 ♀, M.W.S. Oriente Prov.: Loma del Gato, Sierra Maestra, May 26–28, 1959, 2 ♀, M.W.S. Pinar del Río Prov.: Soroa, April, 1964, 1 ♀, F.Z.

DISCUSSION: The species is known from Cuba, Hispaniola, and Puerto Rico. There appear to be no consistent differences among the populations of the three islands.



FIGS. 53–59. Structures of *Polypsocus fasciatus* Banks. Fig. 53. ♂ forewing. Fig. 54. ♀ cell R of forewing, scale of Fig. 53. Fig. 55. ♂ hypandrium, left half. Fig. 56. ♂ phallosome, scale of Fig. 55. Fig. 57. ♀ lacinial tip. Fig. 58. ♀ gonapophyses, half scale of Fig. 57. Fig. 59. ♀ spermatheca, half scale of Fig. 57.

KEY TO THE GENERA AND SPECIES OF CUBAN AMPHIPSOCIDAE

1. Radial fork stem of forewing (Rs beyond rs-m crossvein) exceedingly short, its branches very long, nearly half length of forewing. M of forewing two-branched ..... *Polypsocus* (single Cuban species, *P. fasciatus* Banks)

   Radial fork stem of forewing about as long as its branches, the latter decidedly less than a third length of forewing. M of forewing three-branched ..... *Dasydemella* (single Cuban species, *D. dezayasi*, new species)

FAMILY CAECILIIDAE ENDERLEIN

Caecilius antillanus Banks

C. antillanus Banks, 1938, p. 288.

DIAGNOSIS: A species of the *africanus* group (Mockford, 1966). Wings long and slender, length of forewing about 3.5 times greatest width. Body mostly yellow, head unmarked, wings clear.

This species was described adequately by Mockford (1966). Originally described from Cuba, it is widely distributed in the American Tropics (Mockford, 1966) and reaches Florida. All adult specimens known to me are females (81 specimens), suggesting that the species is parthenogenetic.

RECORDS: Las Villas Prov.: Soledad, Botanical Garden, 1, 2 April (Myers); 6 to 20 August (Banks) (type material); same locality, May, 1967, in grasses, 12 ♀, F.Z.

Caecilius indicator Mockford

C. indicator Mockford, 1969a, p. 103.

DIAGNOSIS: A species of the *caligonus* group (Mockford, 1966). Wings unbanded; body and wings yellow. Male vertex dark brown, that of female yellow. Differing from *C. dificilis* Mockford (Bahamas, Hispaniola, Puerto Rico) by relatively longer spermathecal gland (about 2.0 times as long as wide versus about 1.5 times as long as wide in *C. dificilis*).

This species was described adequately by Mockford (1969). It occurs throughout Florida and in the Bahama Islands. It is represented in the Cuban material by two females. Both possess the pterostigmal spur vein, which is rare in Floridian material.

RECORDS: Oriente Prov.: Gran Piedra nr. Santiago, May 30 to 31, 1959, 1 ♀, M.W.S.; same locality, June, 1967, 1 ♀, F.Z.

Caecilius tamiami Mockford

C. tamiami Mockford, 1965b, p. 150.

DIAGNOSIS: A species of the *flavidus* group (Mockford, 1965). Body color yellow, with no indication of lateral reddish brown stripe. Wings elongate and slender, male forewing slightly over 3.0 times as long as its greatest width.

This species was described adequately by Mockford (1965). Cuban material appears identical with the Florida material of this species.

RECORDS: Oriente Prov.: Cupeyal, Yateras, June, 1964, 1 ♂, F.Z.; Gran Piedra nr. Santiago, June, 1967, 1 ♀, F.Z.

Caecilius pulchellus, new species

DIAGNOSIS: A species of the *subflavus* group (Mockford, 1965). Similar to *C. subflavus* Aaron and *C. biminiensis* Mockford, but differing from both by presence of distinct spot in cell M_1 and another in base of cell M_3 of forewing.

Male. Measurements (head capsule lost after mouthparts removed):

FW	T	t_1	t_2	t_1ct
2313	770	274	95	19

MORPHOLOGY: Lacinial tip (fig. 61) nearly flat but showing slight median and slight lateral cusp. Phallosome (fig. 62) with base gently rounded, thickened; parameres tapering toward tips, each bearing minute pores over distal third. Hypandrium (fig. 66): free margin with short, slightly protruding median bare space flanked by two short setae and two much longer ones each side; two setae in about middle of hypandrium much longer than surrounding ones. Paraproctal papillar field (fig. 63) with papillae decidedly variable in size; short, acuminate spine on free margin near field (fig. 64). Epiproctal papillar field (fig. 65) of numerous relatively long papillae protruding at many angles; pair of long, curved setae just distad of field.

COLOR (in alcohol): Body color in general scarcely discernible due to poor preservation. Antennae apparently medium brown on scape and pedicel, lighter on flagellum, (but only first two flagellar segments present). Thoracic terga medium brown laterally with broad band of yellowish white down middle. Forewings (fig. 60) clear except for brown spot as follows: one in distal end of cell R narrowly separated from veins, one very diffuse in pterostigma bordering posterior angle, one in cell R_1 just outside of pterostigma and bordering its posterior angle, one in base of cell R_5 separated from veins, one in cell M_1 separated from veins, faint one in cell M_2, one in

base of cell M_3 narrowly separated from veins, one surrounding distal two-thirds of cubital loop, one in cell Cu_{1b} near its middle but extending diffusely back to wing margin, one covering much of cell Cu_2, darkest in its distal half. Hindwings clear, unmarked.

HOLOTYPE ♂: Pinar del Río Prov.: Soroa, April, 1964, F.Z.

Caecilius flavibrunneus Mockford

C. flavibrunneus Mockford, 1969a, p. 87.

DIAGNOSIS: A species of the *subflavus* group (Mockford, 1965), but differing from other known members of group by absence of banding pattern in wings, having forewings heavily brown-washed, and having head dull creamy white marked with brown band on each side.

The species was described adequately by Mockford (1969). Outside of Cuba, it is known from New Providence Island, Bahamas.

RECORDS: Oriente Prov.: Florida Blanca nr. Alto Songo, May 23 to 24, 1959, 1 ♀, M.W.S.; Moa, June 5, 1959, beating pines, etc., 1 ♀, M.W.S.

KEY TO THE CUBAN SPECIES OF CAECILIUS

1. Labrum at each anterolateral corner bearing slender, pointed stylet. Lacinial tip shallowly bicuspid. A yellow species usually found on grass and palm foliage ..... (*africanus* group). ..... *C. antillanus* Banks

   Labrum without stylets. Lacinial tip either in form of two rounded lobes or distinctly bicuspid 2

2. Lacinial tip in form of two rounded lobes. Male with anterior and middle tibiae appearing at least slightly swollen. A yellow species generally on pine foliage ..... (*flavidus* group) .... *C. tamiami* Mockford

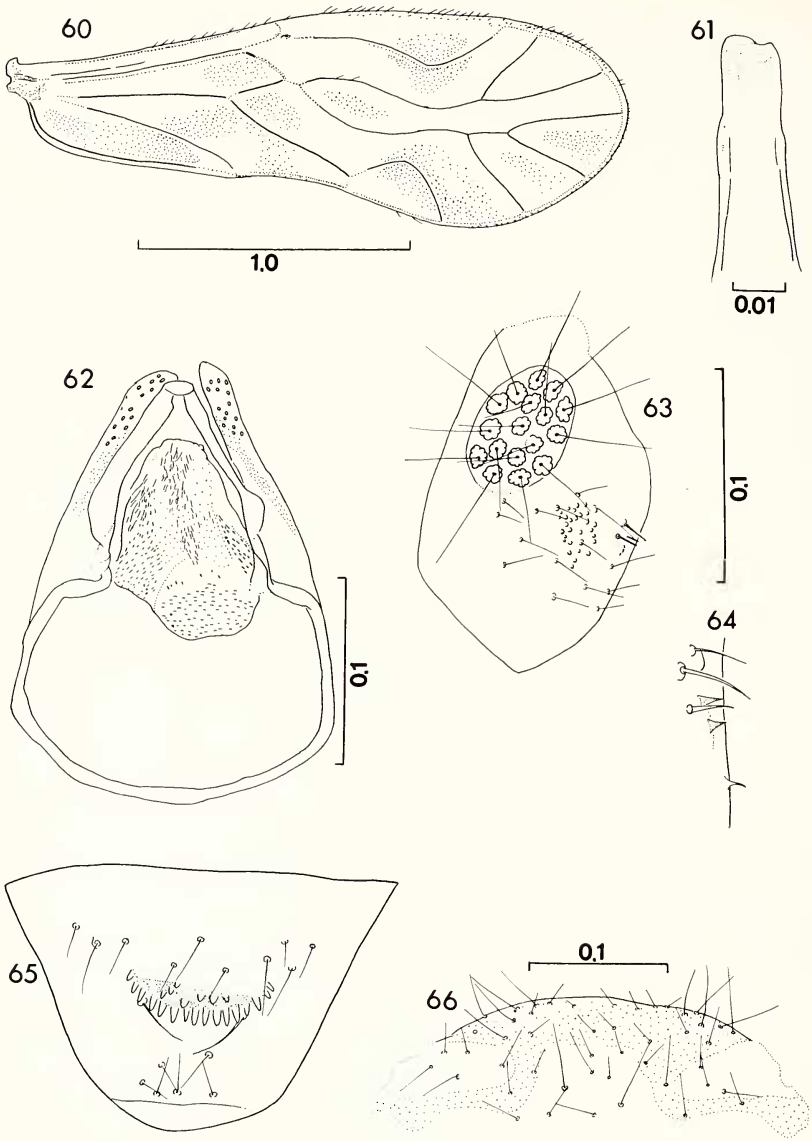
   Lacinial tip bicuspid. Male with anterior and middle tibiae normal 3

3. Males and occasionally females with spur vein descending from apex of posterior angle of pterostigma; females without spur vein having posterior angle of pterostigma pointed at apex. A yellow species with vertex of head in male dark brown ..... (*caligonus* group) ..... *C. indicator* Mockford

   No spur vein from apex of posterior angle of pterostigma. Male with vertex of head not darker than surrounding cuticle. Body and wings either predominantly brown or, if yellow, wings marked with distinct brown spots ..... (*subflavus* group) 4

4. Forewings brown washed, the brown color only slightly accentuated below posterior angle of pterostigma and in base of cell R_5 .... *C. flavibrunneus* Mockford

   Forewings with distinct brown spots on clear background, spots forming pattern as in figure 60 ..... *C. pulchellus*, new species



FIGS. 60–66. Structures of *Caecilius pulchellus*, new species ♂. Fig. 60. Forewing. Fig. 61. Lacinial tip. Fig. 62. Phallosome. Fig. 63. Paraproct. Fig. 64. Free margin of paraproct distad of papillar field, scale of Fig. 61. Fig. 65. Epiproct, twice scale of Fig. 62. Fig. 66. Hypandrium.

FAMILY PHILOTARSIDAE PEARMAN

Aaroniella achrysa (Banks), new combination

Graphocaecilius achrysus Banks, 1941, p. 391.

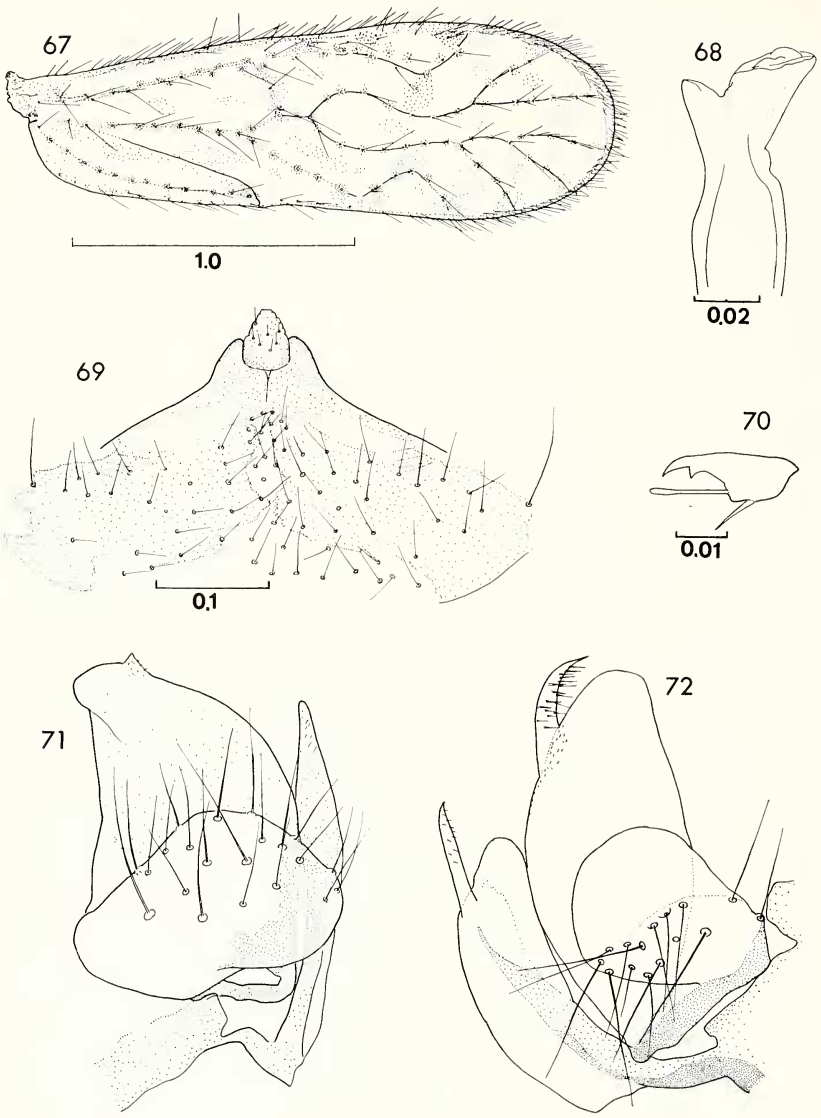
DIAGNOSIS: With radial pattern of spots in forewing (fig. 67). Differing from other described species with this pattern as follows: from *A. maculosa* (Aaron) (eastern United States) by considerably smaller size; from *A. badonneli* (Danks) (Georgia Republic of Soviet Union) by somewhat smaller size (?) and broader cell R_5 of forewing; from *A. pulchra* Thornton (Hong Kong) by broader cell R_5 of forewing and more elongate distal piece of subgenital plate.

IDENTIFICATION: I examined cursorily the type of this species prior to receiving the Cuban material. At that time, I noted its position in *Aaroniella*, but I have not reexamined it for specific characters. The forewing length stated in the original description (1.8 mm) accords rather well with that in a series of *Aaroniella* specimens which I collected in Santo Domingo (2.04 to 2.30 mm for six specimens). Accordingly, I tentatively regard these as the same species as the type. These specimens were compared with the Cuban material and no difference was noted.

REDESCRIPTION: Female. Measurements:

	FW	T	t_1	t_2	t_3	$t_1$ct	IO	D	d	IO/D	PO
Cuba ♀	2164	788	258	67	57	9	393	176	116	2.23	0.66
Florida ♀	2254	784	255	73	59	12	409	171	123	2.39	0.72
Dominician Republic ♀	2145	807	270	63	67	10	400	182	121	2.20	0.66

MORPHOLOGY: Epicranial line present but not reaching ocellar interval; frontal lines absent. Head with scattered short setae, several long setae on vertex toward posterior margin near compound eyes. One long seta directed forward on postclypeus near lateral margin on each side. Lacinial tip (fig. 68) with relatively large median cusp, lateral cusp with a few low, rounded denticles. Terminal segment of maxillary palpus with two basiconic sensilla, the seta of each relatively long and slender. Distal flagellomere terminating in seta longer than the segment. Scattered long setae over entire antenna. A basiconic sensillum with pointed filament near tip of sixth and another near tip of tenth flagellomere. Each pretarsal claw (fig. 70) with slender, curved, slightly knobbed pulvillus and curved seta at base ventrally. Pterostigma with spur vein from its posterior angle. In hindwing R_1 setose its entire length, likewise median vein; radial fork stem nearly so. Subgenital plate (fig. 69) with pigmented arms poorly developed;



FIGS. 67–72. Structures of Cuban Philotarsidae and Pseudocaeciliidae. Figs. 67–71. *Aaroniella achrysa* (Banks) ♀. Fig. 67. Forewing. Fig. 68. Lacinial tip. Fig. 69. Subgenital plate. Fig. 70. Pretarsal claw. Fig. 71. Gonapophyses, half scale of Fig. 68. Fig. 72. *Cladioneura coriacea* (Roesler) ♀, gonapophyses, twice scale of Fig. 69.

bearing scattered setae except on its distal third, but bare area not separated by distinct line; terminal piece crenulate on its free margin, bearing six minute setae. Gonapophyses (fig. 71): first valvula gradually tapering from about middle to acuminate tip, the tip bearing basally-directed minute spinelets; second valvula with low, spinulose lobe near distal end; third valvula with scattered setae, two very long ones near base, 9 and 13 marginal setae in specimen examined. Epiproct and paraproct with scattered long setae; sense cushion with 13 and 14 trichobothria in specimen examined.

COLOR (in alcohol): Antennae color-banded as usual for the genus. Compound eyes and ocelli black. Ground color of body and head dull yellowish white. Head with broad band of medium brown spots along epicranial line and similar broad band bordering each compound eye. Postclypeus with several pairs of medium brown striae. Thoracic terga pale brown, slightly darker on anterior mesonotal lobe. Thoracic pleura medium brown with scattered purple pigment granules, especially concentrated below wing bases. Forelegs and middle legs each with broad medium brown basal band on femur and narrow subapical band of same color; tibia with subapical medium brown band. Hind femur entirely medium brown, tibia same as others. Forewing (fig. 67) with usual pattern for genus, spot in basal region of cell R_5 placed almost in constriction; another spot in this cell immediately distad of most constricted region but well basad of spot forming part of radial series. Spot in cell Cu_2 diffuse and more or less running length of cell. Hindwings unmarked. Abdomen irregularly blotched dorsally on preclunial segments with spots of purple pigment granules; these concentrated in line along each side and below this broad ventrolateral band on each side; subgenital plate and gonapophyses medium brown; clunium, epiproct, and paraprocts mottled with pale brown.

TYPE LOCALITY: Dominican Republic: San José de las Matas, 1000 to 2000 ft., P. J. Darlington Jr. The type is in the Museum of Comparative Zoology, Cambridge, Massachusetts.

RECORDS: Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, 6 ♀, 3 nymph, M.W.S.; Gran Piedra nr. Santiago, May 30–31, 1959, 1 ♀, M.W.S.; Loma del Gato, Sierra Maestra, May 26–28, 1959, 2 ♀, M.W.S. Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, 2 ♀, M.W.S.

NOTE: The species also occurs in Florida north to Oleno State Park, Columbia County. All adult specimens on hand are females, and I found parthenogenetic reproduction in laboratory reared females from Alachua County, Florida.

FAMILY PSEUDOCAECILIIDAE PEARMAN

Pseudocaecilius citricola (Ashmead)

Psocus citricola Ashmead, 1879, p. 228. Complete synonymy in Smithers, 1967, p. 73.

DIAGNOSIS: Forewing membrane clear with brown band across pterostigma and another across areola postica. Differences from *P. elutus* Enderlein (Old World Tropics) and *P. formosanus* (Banks) (Taiwan) not known.

The species was described adequately by Chapman (1930). It occurs throughout the American Tropics, north through Mexico into southern Texas, and through most of Florida. The Old World species *P. elutus* Enderlein is very similar and may prove to be the same. Only females are known, and the species is probably parthenogenetic.

RECORD: Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, 1 ♀, M.W.S.

Cladioneura (Scytopsocus) coriacea (Roesler)

Scytopsocus coriaceus Roesler, 1940, p. 12.
Cladioneura coriaceus (Roesler): Roesler, 1944, p. 151.

DIAGNOSIS: Morphological differences between females of the two described species, *C.* (*S.*) *coriacea* (Roesler), and *C.* (*S.*) *difficilis* (Roesler), not known. Identification here based on geographic distribution, *C.* (*S.*) *difficilis* being known only from southern Brazil, and *C.* (*S.*) *coriacea* having been found north into southern Mexico.

The species was described adequately by Roesler (1940). As yet no males have been found in the Antilles. Material examined from Nova Teutonia, Brazil, as well as the Cuban material, shows the setae of the third valvula ending abruptly along a curved line about half the distance from the basal attachment point to the apical margin of the valvula (Fig. 72).

RECORDS: Camagüey Prov.: Monte Imías nr. California, June 7, 1959, 1 ♀, M.W.S. Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, 5 ♀, M.W.S. Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, 2 ♀, M.W.S.

KEY TO THE CUBAN GENERA AND SPECIES OF PSEUDOCAECILIIDAE

1. Setae of forewing located on veins, not to their sides. Pretarsal claws without preapical denticle. Cuban species predominantly yellow ..... *Pseudocaecilius* (single Cuban species, *P. citricola* [Ashmead])

Setae of forewing located to sides of veins, generally not on them. Pretarsal claws each with preapical denticle. Color predominantly brown ..... *Cladioneura* (*Scytopsocus*)
(single Cuban species *C.* (*S.*) *coriacea* [Roesler])

FAMILY ARCHIPSOCIDAE PEARMAN

Archipsocus panama Gurney

A. panama Gurney, 1939, p. 505 (Not *A. panama* Gurney: Mockford, 1953, p. 122).

DIAGNOSIS: As noted in key, and as follows: male with a field of heavy bristles to each side of midline on clunium. Free margin of hypandrium with heavy bristles laterally.

The species was described adequately by Gurney (1939). Cuban and middle American material differs from Floridian material which I previously assigned to this species by possession of heavy bristles laterally on the free margin of the hypandrium. Therefore, it appears that the Floridian form is a distinct species. Measurements of antennomeres of two Cuban females, the only Cuban females with antennae complete, are as follows:

S	P	f_1	f_2	f_3	f_4	f_5	f_6	f_7	f_8	f_9	f_{10}	f_{11}
54	85	93	61	61	65	45	61	44	54	43	52	82
62	90	106	62	62	63	49	61	50	55	44	57	81

RECORD: Habana Prov.: Santiago de las Vegas, June, 1965, web in anona, 4 ♂, 15 ♀, F.Z.

Archipsocus floridanus Mockford (?)

A. floridanus Mockford, 1953, p. 116.

Although the Cuban specimens are paler than the Floridian material, they agree closely with the latter in the shape of the phallosome (except as noted below), shape of the subgenital plate, and antennal diagram. Two morphological differences were found: (1) the number of setae in the ventral half of the female paraproct is less in the Cuban specimens (15 and 20 in the two examined versus 25 to 29 in five Florida females), (2) the basal struts of the phallosome on their inner margins do not converge near the base before meeting at the base. As variation in these characters in the Cuban material is not yet understood, they do not seem to warrant specific distinction at present.

RECORDS: Habana Prov.: Marianao, June, 1967, webs on tree trunks, 1 ♂, 3 ♀, F.Z.

Archipsocopsis species

This species is represented by a single macropterous female in very bad condition. It appears to be intermediate in size between the two described Floridian species *A. frater* Mockford and *A. parvulus* Mockford. I decline to describe it as new until additional material is available.

RECORD: Oriente Prov.: Yateras, June 1, 1959, M.W.S.

Pseudarchipsocus, new genus

DIAGNOSIS: Forewing with venation of *Archipsocus*, but vein IIA, absent in *Archipsocus*, weakly represented and apparently joining IA. Differing from *Archipsocus* by vivipary and by possession of only single pair of gonapophyses, the setose third valvulae, these not as wide as in *Archipsocus*. Differing from *Archipsocopsis* by possession of gonapophyses and by having discoidal sensilla at distal ends of flagellomeres 6 and 10 each bearing central filament. Differing from both *Archipsocus* and *Archipsocopsis* by having lacinial tip tridentate (fig. 75) and by lack of closed cell in hindwing.

TYPE SPECIES: *P. guajiro*, new species.

Pseudarchipsocus guajiro, new species

DIAGNOSIS: With characters of genus.

Macropterous female. Measurements:

FW	F	T	t_1	t_2	IO	D	d	IO/D	PO
1857	500	683	171	105	454	169	88	2.68	0.52

Antenna:

S	P	f_1	f_2	f_3	f_4	f_5	f_6	f_7	f_8	f_9	f_{10}	f_{11}
68	113	231	100	102	95	92	88	86	84	84	81	109

MORPHOLOGY: f_1 with two discoidal sensilla in basal half; f_4 with a discoidal sensillum at distal three-fourths bearing short cone; other discoidal sensilla as in generic diagnosis. Middle denticle of lacinial tip placed closer to lateral than to median one. Distal segment of maxillary palpus bearing one short, thin walled trichoid sensillum just basad of half length of segment. Labrum with well developed stylets. Conspicuous discoidal sensillum near each lateral extreme of prementum (homolog in *Archipsocus* is a macrotrich). In forewing (fig. 73), pterostigma distinct only at base; branches of Rs distinct but not reaching wing margin. Hindwing (fig. 74) with anterior margin sparsely ciliated except in middle and in distal third; posterior margin thrown into distinct lobe basad of end of Cu_2. Setae of third

valvula (fig. 77) mostly distant from margin; one seta longer than others, but long seta not occupying same position on valvulae of the two sides. Subgenital plate (fig. 78) as in *Archipsocus*. Epiproct (fig. 76a) triangular. Paraproct (fig. 76b) with no trace of sense cushion but with well developed field of short, posterodorsally directed setae in ventral half.

COLOR (in alcohol): Compound eyes and ocellar interval black. Remainder of head and thorax medium tawny brown. Wings clear, colorless except *stigmasac* in forewing conspicuous dark brown spot, and pterostigma brown basally. Legs and antennae yellowish white. Membranous portion of abdomen apparently without cuticular pigment but suffused with purplish brown subcuticular pigment. Clunium and terminal regions pale brown; clunium with purplish brown subcuticular pigment.

HOLOTYPE: Macropterous ♀, Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, M.W.S.

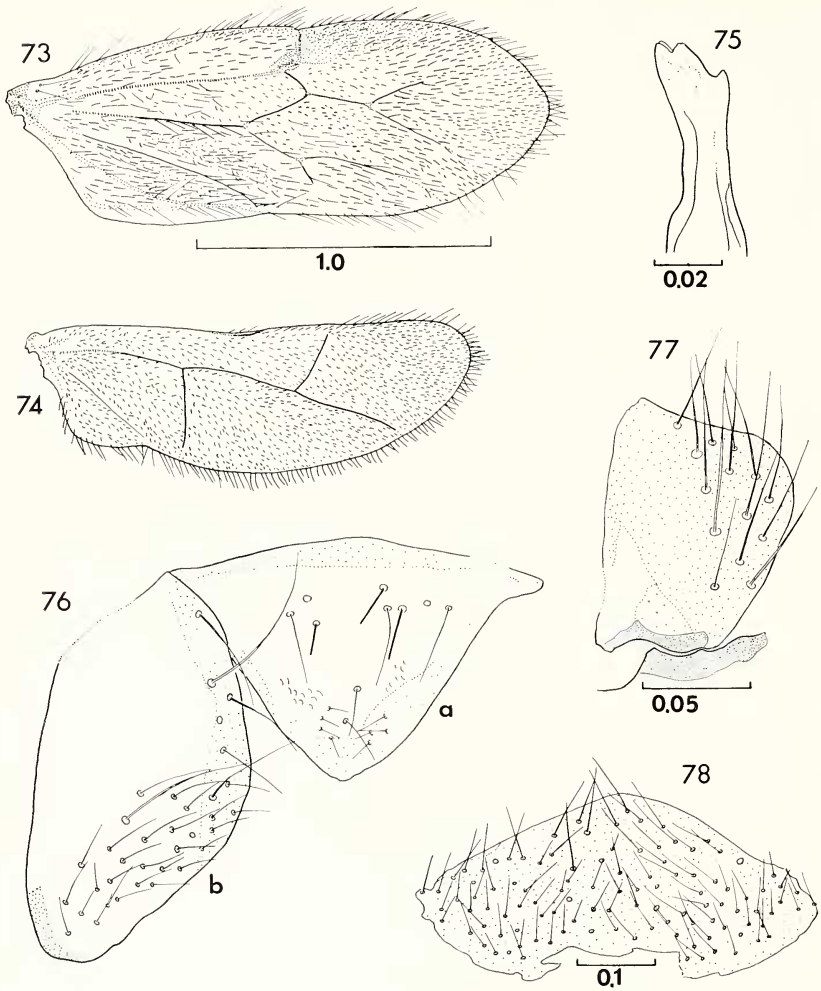
KEY TO THE GENERA AND SPECIES OF CUBAN ARCHIPSOCIDAE

1. Males long winged. Females with single pair of gonapophyses, the slightly reduced, setose third valvulae; viviparous (i.e., gravid females containing embryos) ..... *Pseudarchipsocus*, new genus (single Cuban species *P. guajiro*, new species)
   Males short winged or wingless. Females either with two pairs of gonapophyses and oviparous or with no gonapophyses and viviparous 2
2. Discoidal sensilla of flagellomeres 6 and 10 each with very small central cone. Females with no gonapophyses and viviparous ..... *Archipsocopsis* (single Cuban species undetermined)
   Discoidal sensilla of flagellomeres 6 and 10 each with central filament. Females with two pairs of gonapophyses and oviparous ..... *Archipsocus* 3
3. Head in dorsal view broad and short with postclypeus relatively narrow and inconspicuous. Phallosome with parameres not joined basally ..... *A. panama* Gurney
   Head in dorsal view at least as long as wide, with postclypeus bulging and somewhat wider than region of head immediately basal to it. Phallosome with parameres joined basally ..... *A. floridanus* Mockford (?)

FAMILY LACHESILLIDAE BADONNEL

Graphocaecilius normalis, new species

DIAGNOSIS: Differing from *G. trypetoides* Enderlein and *G. in-*



FIGS. 73–78. Structures of *Pseudarchipsocus quajiro*, new genus, new species ♀. Fig. 73. Forewing. Fig. 74. Hindwing. Fig. 75. Lacinial tip. Fig. 76a. Epiproct, b. paraproct, half scale of Fig. 75. Fig. 77, Gonapophyses. Fig. 78. Subgenital plate.

terpretatus Roesler in lack of wing markings. Differing from *G. luridus* Enderlein in smaller size (forewing length of type 1.99 mm. versus 2.8 mm. in *G. luridus*) and fewer ctenidia on posterior t_1 (17 in type versus 21 in *G. luridus*). Differing from *G. enderleini* Williner

and *G. citramans* Williner by much smaller size (*G. citramans* is probably a species of *Dasydemella*).

Female. Measurements:

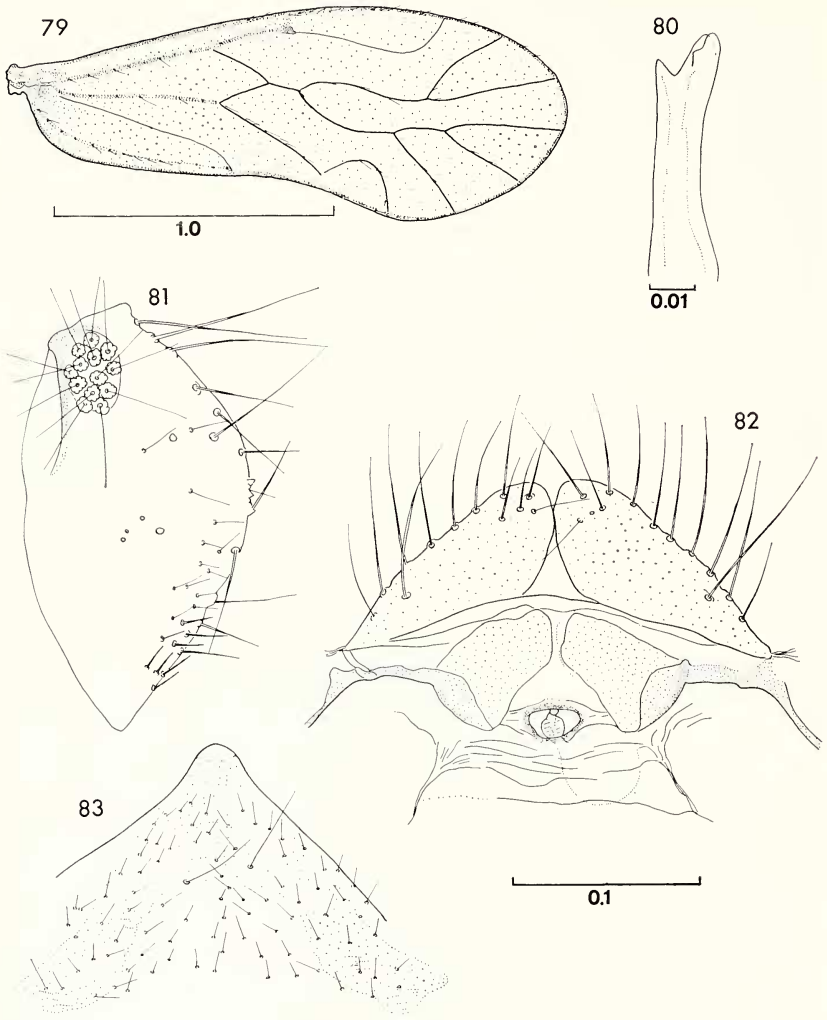
f_1	f_2	f_3	FW	F	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
336	220	178	1990	395	691	233	100	17	287	193	107	1.49	0.55

MORPHOLOGY: Ocelli absent. Antennal sensilla: f_1 with three discoidal sensilla each with raised edges and small central cone in basal sixth of segment; discoidal sensillum near distal end of f_4; scattered small trichoid sensilla on all flagellomeres present (f_1 to f_5). Short, broad labral stylets present. Lacinial tip (fig. 80) bifid; long lateral tyne slightly subdivided at tip. Pretarsal claw with preapical denticle, pulvillus of medium width, and basal short seta. Pearman's organ (rasp and mirror) present on posterior coxa. Forewing with sparse, scattered setae on all veins and around anterior and distal margin to end of Cu_{1a} on posterior margin. Hindwing without setae. Subgenital plate (fig. 83) with weakly differentiated distal lobe and pigmented arms, the latter curving outward at anterior ends. Setae scattered over surface of plate but two in middle area much longer than others. Gonapophyses (fig. 82) forming close ensemble with ninth sternum; third valvulae setose, each with rank of long setae along lateral edge; a lobe closely appressed to median edge of each third valvula probably representing second valvula; stem of first valvula conspicuous and joined to bases of other two valvulae. Ninth sternum (fig. 82) with median sclerotized ring around spermapore and sclerotized band on each side from ring to first valvular stem. Sense cushion of paraproct (fig. 81) small, with 13 trichobothria (each side) and seta without basal floret; three to four long setae on inner margin of paraproct adjacent to sense cushion; middle inner margin of paraproct bearing two short hyaline cones in addition to long setae; lower inner margin with broad band of setae directed posterodorsally. Epiproct with long outer setae and shorter median setae.

COLOR (in alcohol): Compound eyes black. Body, appendages, and wing veins tawny brown. Membranous portions of abdomen suffused with purplish brown pigment. Wing membranes with slight tawny cast, unmarked (forewing, fig. 79).

HOLOTYPE ♀ AND 1 ♀ PARATYPE: Oriente Prov.: Loma del Gato, Sierra Maestra, May 26–28, 1959, M.W.S.

PARATYPES: Las Villas Prov., Topes de Collantes, Sierra de Trinidad, June 11, 1959, 1 ♀, M.W.S. Oriente Prov., Gran Piedra nr. Santiago, May 30–31, 1959, 1 ♀, M.W.S.



FIGS. 79–83. Structures of *Graphocaecilius normalis*, new species ♀. Fig. 79. Forewing. Fig. 80. Lacinial tip. Fig. 81. Paraproct, scale of Fig. 82. Fig. 82. Gonapophyses and ninth sternum. Fig. 83. Subgenital plate, half scale of Fig. 82.

Lachesilla aethiopica (Enderlein)

Pterodela pedicularia var. *aethiopica* Enderlein, 1902, p. 11.
Lachesilla aethiopica (Enderlein): Badonnel, 1949b, p. 53.

DIAGNOSIS: A species of the *pedicularia* group (Garcia-Aldrete, 1972), differing from other species of group known from both sexes as follows: male paraprocts each with mesial prong or acuminate tubercle on inner margin; male epiproct with median posterior extension in the form of broad lobe; distal part of clasper slender, lacking process on its outer edge.

The female of this species was described adequately by Badonnel (1949b). The male remains undescribed. This African species was recorded by Garcia-Aldrete (1972) from Florida, eastern Mexico, and the West Indian islands of Trinidad, Hispaniola, Jamaica, and Puerto Rico. Thus, its occurrence in Cuba is not surprising.

RECORD: Pinar del Río Prov.: Soroa, April, 1964, 1 ♀, F.Z.

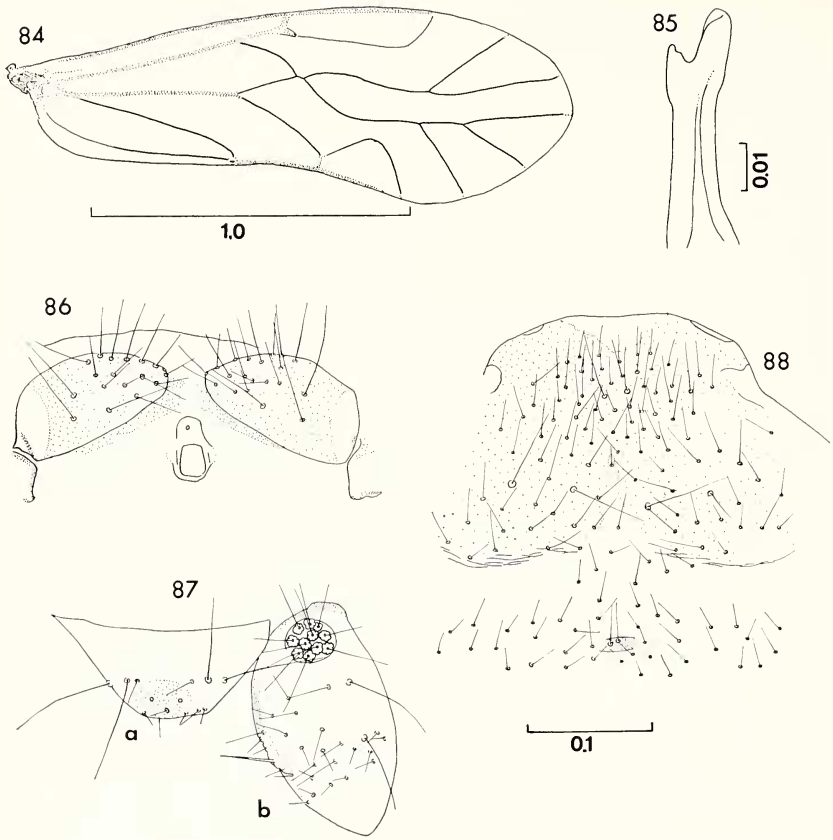
Lachesilla sandersoni, new species

DIAGNOSIS: A species of the *forcepeta* group (Garcia-Aldrete, 1972). Differing from other species of group by following combination of characters: subgenital plate virtually unpigmented, very slightly bilobed posteriorly, without underlying sclerotizations, and bearing four mesial macrosetae. Gonapophyses about 2.25 times as long as broad. Spermapore plate forming well sclerotized ring around spermapore and perforated by minute pore posterior to spermapore.

Female. Measurements:

FW	F	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
1763	322	432	144	92	9	317	185	127	1.72	0.69

MORPHOLOGY: The f_1 with two discoidal sensilla in basal eighth. Lacinial tip (fig. 85) bifid with small subapical denticle on inner tyne and outer tyne slightly subdivided at apex. Labrum with stylets (probably universal in the genus). Forewing (fig. 84) with short R–M fusion. Subgenital plate (fig. 88) as described in diagnosis. Sixth and seventh sterna each with small plate in middle bearing two macrosetae. Gonapophyses (fig. 86) broad basally, increasing in width toward middle, then tapering to rounded apex; bearing three long setae mesially and several shorter setae near and on lateral margin. Spermapore plate (fig. 86) as described in diagnosis. Ninth sternum with sclerotized band on each side subtending gonapophyses. Paraproct (fig. 87b) with numerous scattered setae including two larger than others near long base; free margin bearing very low duplex cone subtended by stout seta; sense cushion with ten trichobothria and one seta without basal floret. Epiproct (fig. 87a) with transverse row of setae across its middle, two long setae near distal end, and scattered shorter setae, all in posterior half.



FIGS. 84–88. Structures of *Lachesilla sandersoni*, new species ♀. Fig. 84. Forewing. Fig. 85. Lacinial tip. Fig. 86. Gonapophyses and ninth sternum, scale of Fig. 88. Fig. 87a. Epiproct, b. paraproct, scale of Fig. 88. Fig. 88. Subgenital plate and preceding sternum.

COLOR (in alcohol): Compound eyes black. Head, thorax, and legs pale tawny brown. Vertex with three anteroposterior bands of slightly darker brown, one along mid-line, other two bordering eyes. Dark purplish brown spot below each antennal base. Abdomen yellowish white; preclunial segments each with slender dark purplish brown ring, rings broadily interrupted ventrally. Wings clear, unmarked, with slight tawny cast.

HOLOTYPE: ♀, Pinar del Río Prov., Aspiro-Rangel, June 16, 1959, M.W.S.

PARATYPES: Oriente Prov., Moa, June 5, 1959, 4 ♀, M.W.S.

KEY TO THE GENERA AND SPECIES OF CUBAN LACHESILLIDAE

1. In forewing a single rank of setae along all veins except Cu_2 and around entire wing margin ..... *Graphocaecilius*
   (single Cuban species, *G. normalis*, new species)
   In forewing, setae, if any, minute and sparse, not readily visible with dissecting microscope ..... *Lachesilla* 2
2. Gonapophyses broad basally, each tapering evenly to blunt tip. Spermapore sclerite bearing minute perforation posterior to spermapore ..... *L. sandersoni*, new species
   Gonapophyses of even width to near tip where each forms lateral shoulder and tapers to acute point. Spermapore sclerite without perforation posterior to spermapore ..... *L. aethiopica* (Enderlein)

FAMILY PERIPSOCIDAE PEARMAN

Peripsocus pauliani Badonnel

P. pauliani Badonnel, 1949b, p. 56.

DIAGNOSIS: Forewing obscurely marked with darker grayish brown regions along most veins on paler grayish brown background (Badonnel, 1949b, fig. 56). Subgenital plate (Badonnel, 1949b, fig. 57) with distal process longer than wide; lateral arms of pigmented area pointed anteriorly.

This species was described adequately by Badonnel (1949b). It was originally described from the Ivory Coast. Thornton and Wong (1968) recorded it from several localities in the Oriental Region and the Pacific. Although it has not previously been noted from the Western Hemisphere, material is on hand from southern Florida, Mexico, Puerto Rico, Jamaica, Surinam, French Guiana, and Brazil.

RECORDS: Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, 2 ♀, 1 nymph, M.W.S.; Guantánamo Bay, U. S. Naval Base, Feb. 18–19, 1965, black light trap, 1 ♀. Pinar del Río Prov.: Viñales, Sept., 1966, in pine, 1 ♀, F.Z.

Peripsocus stagnivagus Chapman

P. stagnivagus Chapman, 1930, p. 376.

DIAGNOSIS: Forewing uniformly pale grayish brown except for darker marks of same color: a spot in base of cell R_5 and another covering most of cells M_1 and M_2 and extending into M_3 and R_5 (Chapman, 1930, pl. XXI, fig. 5). Subgenital plate (Chapman, 1930, pl. XIX, fig. 5) with distal process about as long as wide, lateral arms of pigmented area slender.

This species was described adequately by Chapman (1930). It is known from southeastern United States and numerous (unpublished) localities in Mexico.

RECORD: Pinar del Río Prov.: Viñales, Sept., 1966, in pine, 1 ♀, F.Z.

KEY TO THE CUBAN SPECIES OF PERIPSOCUS

1. Lateral arms of pigmented area of subgenital plate each terminating anteriorly as acuminate point ..... *P. pauliani* Badonnel
   Lateral arms of pigmented area of subgenital plate terminating bluntly ..... *P. stagnivagus* Chapman

FAMILY ECTOPSOCIDAE EICHLER

Ectopsocus pictus, new species

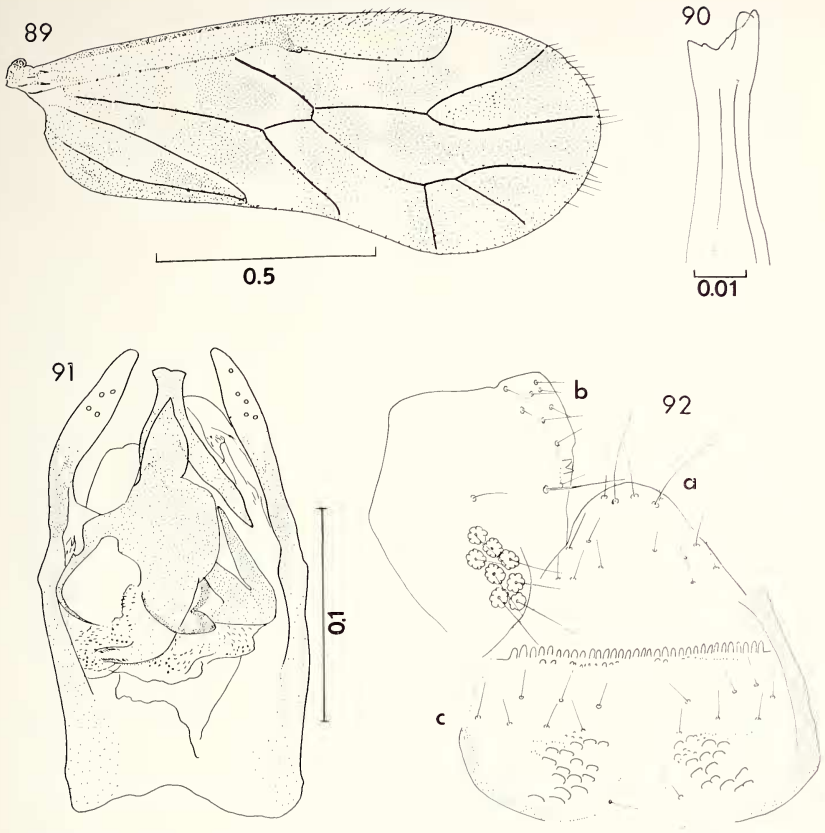
DIAGNOSIS: Forewings with extensive marking pattern (fig. 89) of discrete dark spots on pale background, as in *E. baliosus* Thornton and Wong, *E. machadoi* Badonnel, and *E. strauchi* Enderlein. Differing from *E. baliosus* in having no pale spot at distal end or in middle of cell R_5, much larger dark spot in basal half of cell M_3, and discrete basal and distal dark spot in cell Cu_2. Differing from *E. machadoi* in having dark spots in general more restricted, pterostigma not bordered with dark distally, no pale spot in distal end of cell R_5, and aedeagal arch much more narrow at apex. Differing from *E. strauchi* in having dark spots in general more widespread and dark areas at ends of veins R_1 through M_3 continuous with dark areas more remote from wing margin rather than forming discrete marginal spots.

Male. Measurements:

FW	T	t_1	t_2	t_1ct	IO	D	d	IO/D	PO
1353	491	179	82	12	293	184	130	1.59	0.71

MORPHOLOGY: Ocelli large. Lacinial tip (fig. 90) bifid; lateral tyne much larger than median and slightly bifid at tip; median tyne with minute preapical denticle. Forewing with large *stigmasac*. Relatively long setae around wing margin and regularly but sparsely spaced on all veins except Cu_2. Setae on hindwing margin present from end of vein R_1 to end of R_{4+5}. A long r-m crossvein present in hindwing.

Terminal abdominal segments: Phallosome (fig. 91) open basally; external parameres long, slender, tapering, beset with several pores; aedeagal arch with elongate, slender apex bifid distally; endophallus including several complexly folded sclerites. Clunium with comb of 33 blunt teeth (fig. 92c) and basally from comb on each side of mid-line a field of broad tubercles. Paraproct (fig. 92b) with dis-



FIGS. 89–92. Structures of *Ectopsocus pictus*, new species ♂. Fig. 89. Forewing. Fig. 90. Lacinial tip. Fig. 91. Phallosome. Fig. 92a. Epiproct, b. paraproct, c. middorsal region of clunium.

tinct bifid marginal cone; sense tubercle with eight trichobothria and one seta without basal floret. Epiproct (fig. 92a) with two large setae near apex flanking shorter seta arising from large follicle; several small setae scattered over surface near margin. Hypandrium with heavily sclerotized strap bordering each side; its posterior margin approximately straight and bearing several long setae.

COLOR (in alcohol): Compound eyes black. Head and thorax medium brown. Legs and antennae pale brown. Abdomen (contracted) dull white, mottled with faint purplish brown—possibly banded in fifth to seventh segments. Sclerotized terminal segments

medium brown. Forewings complexely marked (fig. 89); hindwings clear, unmarked.

HOLOTYPE ♂: Oriente Prov.: Ciudamar, Santiago de Cuba, June 1967, F.Z.

Ectopsocus maindroni Badonnel

E. maindroni Badonnel, 1935, p. 81. Complete synonymy in Smithers, 1967, p. 66.

DIAGNOSIS: Forewings clear, unmarked, but vein M_3 slightly accentuated. Phallosome terminating distally in piece in shape of bi-cornered hat (Badonnel, 1946, fig. 93). Subgenital plate with lateral lobes each truncated at tip, the tip bearing two setae (Badonnel, 1935, fig. 12).

The female of this species was described adequately by Badonnel (1935) and the male by the same author (1946). Originally described from Arabia, it was recorded from several localities in southeastern Asia and the Pacific (Thornton and Wong, 1968), and is known in the Western Hemisphere from southern Florida, coastal Texas, the Gulf coast in Mexico, Jamaica, Puerto Rico, Venezuela, Guyana, and French Guiana (Mockford, 1965a).

RECORD: Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, 1 ♀, M.W.S.

Ectopsocus titschacki Jentsch

E. titschacki Jentsch, 1939, p. 120.
E. gabelensis Badonnel, 1955, p. 185.

DIAGNOSIS: Forewing clear, unmarked except slight spot on vein M_3 at wing margin. Endophallic sclerotizations dominated by two large claw-like processes (Badonnel, 1949b, fig. 59). Subgenital plate (Jentsch, 1939, fig. 12) with lateral lobes tapering gradually to tips, each bearing large seta at tip.

This species was described adequately by Jentsch (1939) and Badonnel (1949a). It is known from several localities in West Africa (Ball, 1943; Badonnel, 1949, 1969), Palawan and Hawaii (Thornton and Wong, 1968), and in the American Tropics from Puerto Rico, Trinidad (West Indies), Surinam, Guyana, French Guiana, Brazil (Mockford, 1965a), and tentatively Venezuela (Jentsch, 1939). I have unpublished records from Martinique, Dominica, Mexico, and Guatemala.

RECORDS: Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, 1 ♀, M.W.S. Pinar del Río Prov.: San Vincente, Sierra del Rosario, June 17, 1959, 4 ♂, 4 ♀, M.W.S.

Ectopsocus vilhenai Badonnel

E. vilhenai Badonnel, 1955, p. 189.

DIAGNOSIS: Forewings clear, unmarked. Subgenital plate (Badonnel, 1955, fig. 427) with lateral lobes each terminating in short, pointed process. Phallosome (Badonnel, 1955, fig. 424) bearing ventral arm articulated at base and extending nearly half distance to tip.

This species was described adequately by Badonnel (1955). It has been recorded in the literature only from Angola. I have seen material from the following areas in the American Tropics: Mexico, Venezuela, Trinidad (West Indies), and Puerto Rico.

RECORD: Oriente Prov.: Loma del Gato, Sierra Maestra, May 26–28, 1959, 1 ♀, M.W.S.

Ectopsocopsis cryptomeriae (Enderlein)

Ectopsocus cryptomeriae Enderlein, 1907, p. 100. Complete synonymy in Thornton and Wong, 1968, p. 26.

DIAGNOSIS: Forewings unmarked, iridescent in living and dried specimens. Male clunial sclerotizations somewhat in shape of plow (Chapman, 1930, pl. XIX, fig. 4). Female with elaborate sclerotizations around spermapore (Chapman, 1930, pl. XIX, fig. 12).

The species was described adequately by Chapman (1930) under the name *Ectopsocus pumilis* (Banks). Originally described from Japan, it has been recorded in several localities in southeastern Asia and the Pacific (Thornton and Wong, 1968). It is also known from the Caucasus (Danks, 1955). In America it is common in southeastern United States (Chapman, 1930) and has been found in northern Mexico (Mockford, 1965a).

RECORDS: Camagüey Prov.: Monte Imías nr. California, June 7, 1959, at light, 1 ♂, M.W.S. Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, 1 ♀, M.W.S.; Gran Piedra nr. Santiago, May 30–31, 1959, 1 ♂, M.W.S.; La Siberia, Sierra Maestra, June, 1967, 1 ♀, F.Z. Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, 1 ♀, M.W.S.

KEY TO THE GENERA AND SPECIES OF CUBAN ECTOPSOCIDAE

1. Gonapophyses reduced to rudiments of third valvulae; male clunium bearing complex attachment organ involved in copulation ..... *Ectopsocopsis* (single Cuban species *E. cryptomeriae* (Enderlein)
   Gonapophyses complete; male clunium bearing only apical comb ..... *Ectopsocus* 2

2. Forewing with an extensive pattern of spotting (fig. 89) ..... *E. pictus*, new species
   Forewing unmarked or at most with a few small spots bordering veins at wing margin 3
3. Head and thoracic terga medium to dark brown. Forewing length greater than 1.5 mm ..... *E. vilhenai* Badonnel
   Head and thoracic terga dull yellowish white. Forewing length less than 1.5 mm 4
4. Male clunial comb continuous in middle; female subgenital plate with lateral lobes each tapering gradually to tip, the tip bearing single seta ..... *E. titschachi* Jentsch
   Male clunial comb interrupted in middle; female subgenital plate with lateral lobes each truncated at tip, the tip bearing two setae ..... *E. maindroni* Badonnel

FAMILY HEMIPSOCIDAE PEARMAN

My reasons for placing this Family in Psocetae instead of Homilopsocidae, where other recent authors have placed it, will be discussed in a separate note.

Hemipsocus pretiosus Banks

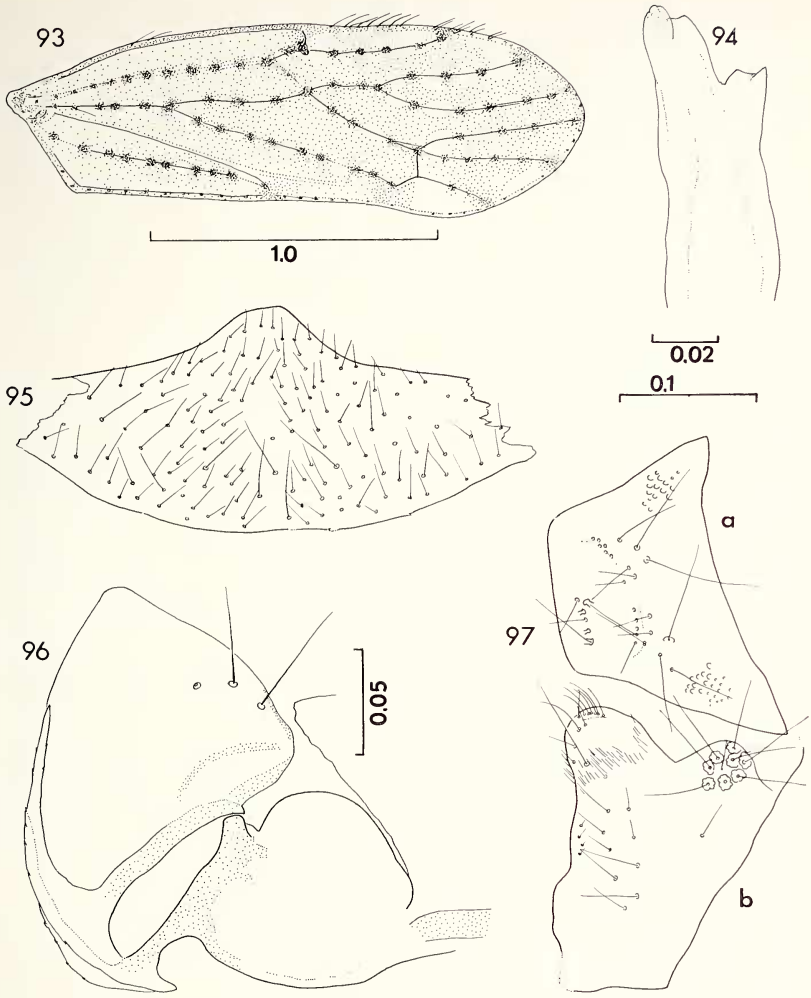
H. pretiosus Banks, 1930, p. 184.

DIAGNOSIS: A species with spots at bases of setae on veins in forewing but differing from other species with this character by having forewing heavily marked with colorless spots on brown background (fig. 93).

REDESCRIPTION: Female. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
2034	935	400	128	17	529	181	111	2.92	0.61

MORPHOLOGY: Antennal flagellum bearing numerous setae of variable lengths and stoutness; flagellum sculptured with transversely oriented areoles; f_1 bearing discoidal sensillum near its base. Labrum bearing short, stubby stylets. Lacinial tip (fig. 94) bifid; lateral tyne shallowly subdivided near apex, median subdivision slightly roughened on surface; median tyne also shallowly subdivided and lateral subdivision with roughened surface. Forewing with pterostigma decidedly narrow—broadest in basal fourth, becoming narrower from there to tip; Rs and M joined at a point. Segment of M from M-Cu branching to Rs-M junction very long, about as long as M-Cu; cells R_3 and M_1 long and narrow, their bordering veins diverging very little toward distal ends; anal angle distinct and marked by thickening of the wing margin.



FIGS. 93–97. Structures of *Hemipsocus pretiosus* Banks ♀. Fig. 93. Forewing. Fig. 94. Lacinial tip. Fig. 95. Subgenital plate, half scale of Fig. 97. Fig. 96. Gonapophyses. Fig. 97a. Epiproct, b. paraproct.

External genitalia and abdominal tip: subgenital plate (fig. 95) approximately triangular, the rounded apex of triangle formed by posterior margin of plate; plate nearly uniformly pigmented on stained preparation; sixth and seventh sterna with broad, pigmented central

regions. Gonapophyses (fig. 96) typical of genus, the broad third valvulae each bearing three setae toward outer margin; basal region of gonapophyses set off from remainder of clunium by line. Epiproct (fig. 97a) truncated distally, divided into basal and distal regions by arc (depressed line in ventral surface only?) paralleled by row of closely set short setae (ventral surface); dorsal surface bearing scattered setae of various lengths; near each basal angle a small field of tubercular and scale-like sculpturing. Paraproct (fig. 97b) with median internal lobe bearing brush of filaments on inner surface, scattered setae and short trichoid sensilla on outer surface and row of curved setae distally; sense cushion with eight trichobothria and central seta without basal floret.

COLOR (in alcohol): Compound eyes black; ocelli ringed internally with purplish brown. Vertex, clypeus, and pronotum yellowish brown; genae, thoracic pleura and legs dusky brown. Preclunial abdominal segments heavily mottled with purplish brown subcuticular pigment. Subgenital plate, sclerotized portions of sixth and seventh sterna, clunium and anal lobes dusky brown. Forewings (fig. 93) marked along veins with alternating dark brown and colorless spots; except at these spots, most of margin medium brown but marked by semicolorless regions bordering wing margin in cells R_1, R_3, M_1, M_2, Cu_{1a}, and Cu_{1b}. Hindwing unmarked.

DISTRIBUTION: In addition to Cuba, the species is known from southern Florida.

RECORDS: Camagüey Prov.: Monte Imías nr. California, June 7, 1959, 1 ♀, M.W.S. Las Villas Prov.: Soledad, 18 Feb. (Myers) (Cotype, sex not det.). Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, 8 ♀, 1 nymph, M.W.S. Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, 1 ♀, M.W.S.

FAMILY MYOPSOCIDAE ENDERLEIN

Myopsocus sparsus (Hagen) (?)

Psocus sparsus Hagen, 1861, p. 8. Complete synonymy in Smithers, 1967, p. 121.

Comparison with my figures of Hagen's type suggests the single Cuban specimen at hand to be the same species. The species occurs throughout southeastern United States. I anticipate redescribing it in a separate publication.

RECORD: Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, 1 ♀, M.W.S.

Myopsocus clypeofasciatus, new species

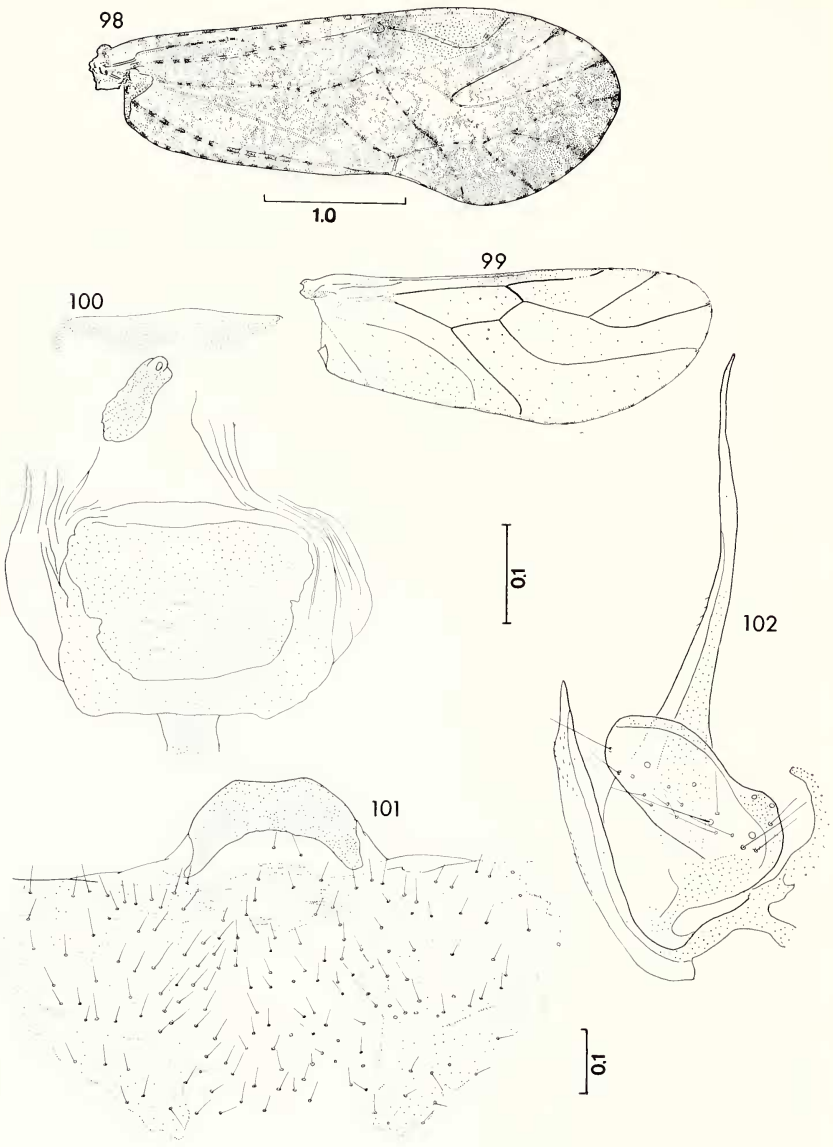
DIAGNOSIS: Differing from the African species *M. fasciatus* (Badonnel) and *M. schoutedeni* (Badonnel) in having forewing band from base of pterostigma to margin in anal cell intermediate in its definition—much less definite than in *fasciatus* and decidedly more definite than in *schoutedeni*. Differing from other described African species (*M. cameruna* Enderlein, *M. intermedia* [Pearman], *M. pauliani* [Badonnel]), the described species of eastern United States (*M. lugens* [Hagen], *M. sparsus* [Hagen]) and seven undescribed species of eastern United States in having posterior femur entirely dark brown.

Female. Measurements:

FW	T	t_1	t_2	t_3	$t_1$ct	IO	D	d	IO/D	PO
3.70	1.43	0.52	0.06	0.09	22	0.49	0.30	0.23	1.61	0.76

MORPHOLOGY: In forewing Rs and M fused a short distance; M touching apex of areola postica at a point. In hindwing, r-m crossvein about half length of Rs stem. Subgenital plate (fig. 101) with basal pigmented area of two lateral triangular pieces narrowly joined posteriorly, the clear area between triangles roughly parallel sided; distal sclerotized piece arched, flat posteriorly, bearing no setae. Ninth sternum (fig. 100) bearing broad anterior sclerite and two narrow, transverse posterior sclerites. Gonapophyses (fig. 102): first valvula constricted near tip; third valvula well sclerotized along basal and dorsal margins; latter margin flexuous. Paraproct with band of fine setae along inner margin, row of long setae along middle ridge plus other scattered setae; sense cushion with 25 trichobothria. Epiproct with arc of setae from near base on each side across middle, arc including four macrosetae posteriorly; apex of epiproct bearing a few setae.

COLOR (in alcohol): Compound eyes black. Body in general creamy yellow irregularly and extensively marked with dark brown and purplish brown spots. A band of dark spots along midline of head from posterior head margin, interrupted behind and in front of ocellar interval and continuing through entire postclypeus. A purplish brown spot in middle of each parietal region; another to each side of and touching ocellar interval; another along each frontal line in front of compound eye. Genae extensively dark brown. Pterothoracic terga mostly dark brown; a purplish brown line bordering each mesoparapsidal suture, and mesoscutellum purplish brown. A dark brown band through middle of mesopleuron. Anterior coxae creamy yellow; middle and posterior coxae dark brown. Anterior femora creamy yellow with dark brown distal ring; middle femora missing; posterior femora entirely dark brown. Preclunial abdominal segments largely



FIGS. 98–102. Structures of *Myopsocus clypeofasciatus*, new species ♀. Fig. 98. Forewing. Fig. 99. Hindwing. Fig. 100. Ninth sternum, scale of Fig. 102. Fig. 101. Subgenital plate. Fig. 102. Gonapophyses.

creamy yellow; first two terga extensively purplish brown; this color continuing posteriorly as broken band of blotches along each side of midline. Peri-anal lobes and clunium dorsally creamy yellow; clunium laterally, subgenital plate and well sclerotized portions of gonapophyses dark brown. Wings as in Figs. 98 and 99.

HOLOTYPE ♀: Pinar del Río Prov.: Soroa, Apr., 1964, F.Z.

Phlotodes minutus, new species

DIAGNOSIS: Apparently smallest known myopsocid, forewings measuring about 2.6 mm in length. All tarsi with t_1 pale and t_2 and t_3 dark brown. Posterior femur creamy yellow except for three dark brown spots on dorsal surface in distal two-thirds. A short spur vein from posterior apex of pterostigma. Vein IA of forewing with scarcely any development of outpocketings.

Male: Measurements:

FW	T	t_1	t_2	t_3	$t_1$ct	IO	D	d	IO/D	PO
2755	945	351	72	77	14	0.21	0.32	0.31	0.66	0.97

MORPHOLOGY: In forewing a minute spur vein from posterior apex of pterostigma; Rs and M meeting at a point; M touching apex of areola postica at a point. Distal margin of wing evenly rounded, not produced at ends of veins. Anal vein not thrown into bulges.

Terminal abdominal segments: Hypandrium (fig. 105) strongly arched toward middle, apex of arch bearing two macrosetae; strongly sclerotized only around its free margins. Phallosome (fig. 104) an elongate closed frame rounded posteriorly, with narrow notch anteriorly; sides slightly widened for short length distad of middle; along midline sclerotized strip becoming wider and more strongly sclerotized posteriorly, rounded at posterior margin. Clunium with pair of rounded lobes (fig. 106c) dorsally, their surfaces shagreened and bearing a few setae. Epiproct (fig. 106a) truncated distally; shagreened over most of surface and granulate along posterior margin. Paraproct (fig. 106b) terminating in single broad spur; sense cushion with 21–22 trichobothria.

COLOR (in alcohol): Compound eyes purple. Body extensively creamy yellow and dark brown. Head creamy yellow except dark brown along posterior margin, genae, anterior corners of postclypeus and narrow band along its anterior margin, and a few small spots near ocelli. Antennal scape and pedicel dark brown, flagellum (only two segments present) creamy yellow. Thoracic terga creamy yellow with a few pale brown blotches but anterior face of anteromesial lobe of mesonotum dark brown. Thoracic pleura extensively creamy yellow

except for dark brown band running length of thorax above middle. Legs creamy yellow except pale brown partial distal ring on first and second femora, dark brown spot just beyond middle, and dark brown distal ring on each tibia; posterior femur and tarsi as described in diagnosis. Forewing as in figure 103, hindwing as in *P. antillanus*. Color of preclunial abdominal segments poorly preserved, apparently creamy yellow with scattered purplish brown subcuticular pigment. Clunium and hypandrium dark brown. Peri-anal lobes colorless except brown around edges.

Female. Measurements:

	FW	T	t_1	t_2	t_3	$t_1$ct	IO	D	d	IO/D	PO
Dominican Republic	2.58	1.00	0.31	0.06	0.08	14	0.35	0.28	0.25	1.27	0.90
Chiapas, Mexico	3.10	1.15	0.39	0.06	0.08	16	0.41	0.29	0.25	1.45	0.87

MORPHOLOGY: Forewing as in male except Rs and M fused for a short distance.

Terminal abdominal segments: Subgenital plate (fig. 108) with distal piece broad basally, narrowing abruptly before middle and slender in distal half; bearing four subterminal setae in two ranks of two plus the two terminal macrosetae. Gonapophyses (fig. 107) typical of genus; first and second valvulae exceedingly slender and acuminate; third valvula parallel sided, bearing numerous marginal setae plus scattered setae over outer surface. Epiproct bearing seven long setae near tip plus numerous scattered shorter setae, mostly in distal half. Paraproct with four macrosetae on end of inner lobe; row of setae along ventral margin; sense cushion with 19–21 trichobothria, two central ones with basal florets poorly developed.

COLOR (in alcohol, Dominican Republic specimen): Similar to male but genae and posterior head margin largely pale brown or creamy yellow; distal brown bands on first and second femora obscure; spots on third femur not so distinct. Antennal flagellum (complete) with faint banding pattern: most of each segment pale brown, its tip colorless.

Specimen from Tabasco, Mexico differing from above in having head marked as in male except a large purplish brown blotch in middle of each parietal area. Preclunial abdominal segments extensively marked with dark purplish brown subcuticular pigment.

HOLOTYPE: ♂, Camagüey Prov.: Monte Imías nr. California, June 7, 1959, M.W.S.

ALLOTYPE: ♀, Dominican Republic, intercepted at Miami, Florida, July 7, 1964, D. A. Miller.

CUBAN RECORD: Oriente Prov., U. S. Naval Base at Guantánamo Bay, Feb. 8–19, 1965, black light trap, 1 ♂ (paratype).

OTHER RECORDS: Mexico: Chiapas: 16.4 mi. E. Tapanátepec on Hwy. 190, July 12–13, 1962, 2 ♂, 1 ♀, E. L. Mockford et al. Tabasco: 4 mi. W. Frontera, June 26, 1966, on trunks of orange, 1 ♀, E. L. Mockford et al. Veracruz, 5 mi. S. Tecolutla, June 26, 1962, 1 ♂, F. Hill.

Phlotodes antillanus, new species

DIAGNOSIS: All tarsi with t_1 pale except at extreme base, t_2 and t_3 medium brown. All femora brown except for narrow subapical pale ring. A short spur vein from posterior apex of pterostigma. Vein IA of forewing bearing two outpocketings, one subbasal, the other at about distal two-thirds. Forewing margin perceptably protruding at tips of vein M_2 and M_3.

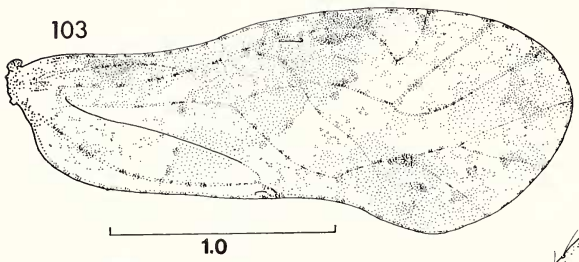
Measurements:

	FW	T	t_1	t_2	t_3	$t_1$ct	IO	D	d	IO/D	PO
Cuba	3.70	1.27	0.45	0.06	0.09	19	0.46	0.31	0.27	1.47	0.85
Dominican Republic	3.29	1.22	0.42	0.06	0.08	18	0.44	0.31	0.25	1.41	0.79
Florida	3.66	1.30	0.44	0.06	0.09	20	0.47	0.31	0.26	1.50	0.82

MORPHOLOGY: In forewing, Rs and M fused a short distance; M connected to areola postica by short crossvein. Distal margin and anal veins of forewing as described in diagnosis.

Terminal abdominal segments—Subgenital plate (fig. 113) with distal piece broad basally, narrowing abruptly before middle and approximately parallel sided from there to tip, bearing in addition to two terminal macrosetae a single and two pairs of smaller subterminal setae, the latter in two ranks of two. Gonapophyses (fig. 111) typical of the genus; first valvula acuminate, short, set at acute angle to its stem; second valvula very slender, curving inward toward tip; third valvula with outer margin slightly bulging toward distal end, valvula beset with several long setae plus a few shorter ones, none marginal. Ninth sternum bearing long, curved sclerite (fig. 112) behind ellipsoidal rim of apparent spermathecal opening. Epiproct bearing four macrosetae in transverse arc before apex; numerous shorter setae scattered over surface. Paraproct with two transverse bands of setae of various lengths converging at end of inner lobe; sense cushion with 22–24 trichobothria.

COLOR (in alcohol): Compound eyes mottled black and gray. Vertex with band of medium brown spots along midline behind ocelli, and along posterior head margin; compound eyes bordered by medium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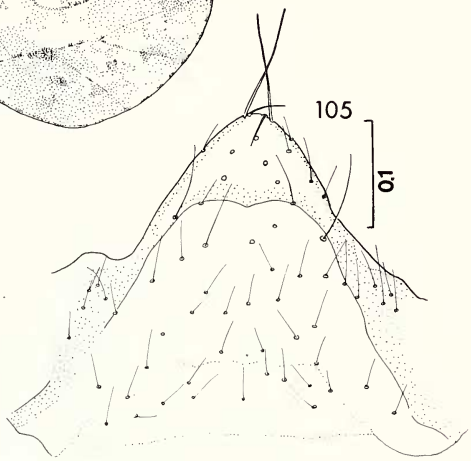
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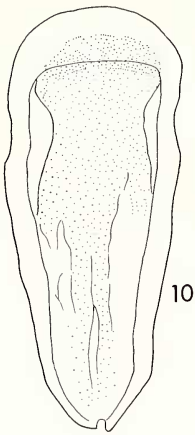
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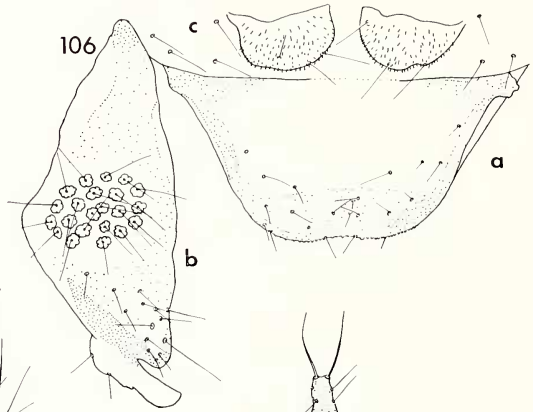
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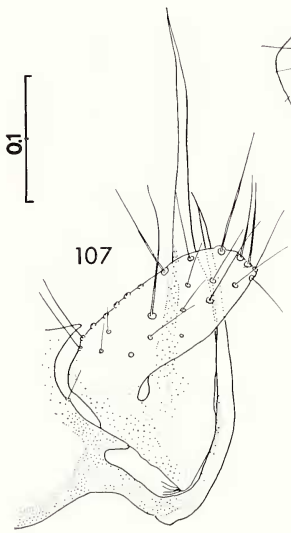
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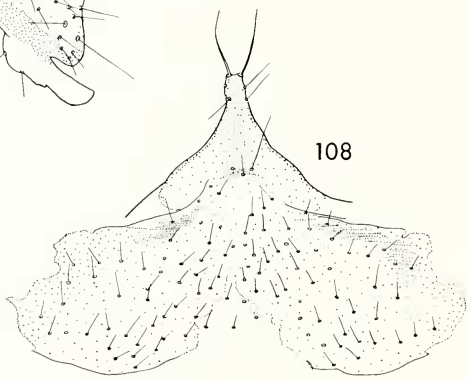
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brown spots on inner margins. Labrum, anteclypeus, a small elongated spot anteriorly on postclypeus, most of genae, entire maxillary palpi and antennae medium brown. Remainder of head creamy yellow except faint purple X-shaped mark centered on ocelli, the anterior arms bordering frontal lines. Thorax mottled medium brown and creamy yellow. Each femur medium brown except for pale subterminal ring; likewise each tibia, the ring least distinct on posterior tibia due to paler brown color on each side of it. Base of each t_1 medium brown; remainder yellowish white; each t_2 and t_3 medium brown. Wings as in figure 109, 110. Abdomen entirely yellowish white mottled with purple, except subgenital plate and portions of clunium near attachments of gonapophyses pale brown.

HOLOTYPE ♀: Oriente Prov.: Sierra Maestra, Loma del Gato, May 26–28, 1959, M.W.S.

CUBAN RECORDS: Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, 1 ♀ (paratype), M.W.S.

OTHER RECORDS: Dominican Republic: Dist. Santo Domingo: Santo Domingo, Arroyo Hondo., Jan. 27, 1954, 1 ♀, R. B. Cumming; Boca Chica, Feb. 2, 1954, 4 ♀, E. L. Mockford and R. B. Cumming; Seibo Province: El Seibo, Jan. 8, 1954, 1 ♀, R. B. Cumming.

United States: Florida: Collier Co.: 2 mi. W. Naples Park, Nov. 29, 1970, beating vegetation, 1 ♀, E. L. Mockford; Hendry Co., April 16, 1954, beating large bromeliad on live oak, 1 ♀, E. L. Mockford; Highlands Co., Archbold Biological Station (all records from light trap by S. W. Frost), Nov. 23, 1958, 1 ♀; Dec. 7, 1959, 1 ♀; Feb. 22, 1960, 1 ♀; Pinellas Co., Ozona, Aug. 19, 1970, beating slash pine and oaks, 1 ♀, E. L. Mockford.

Phlotodes cubanus, new species

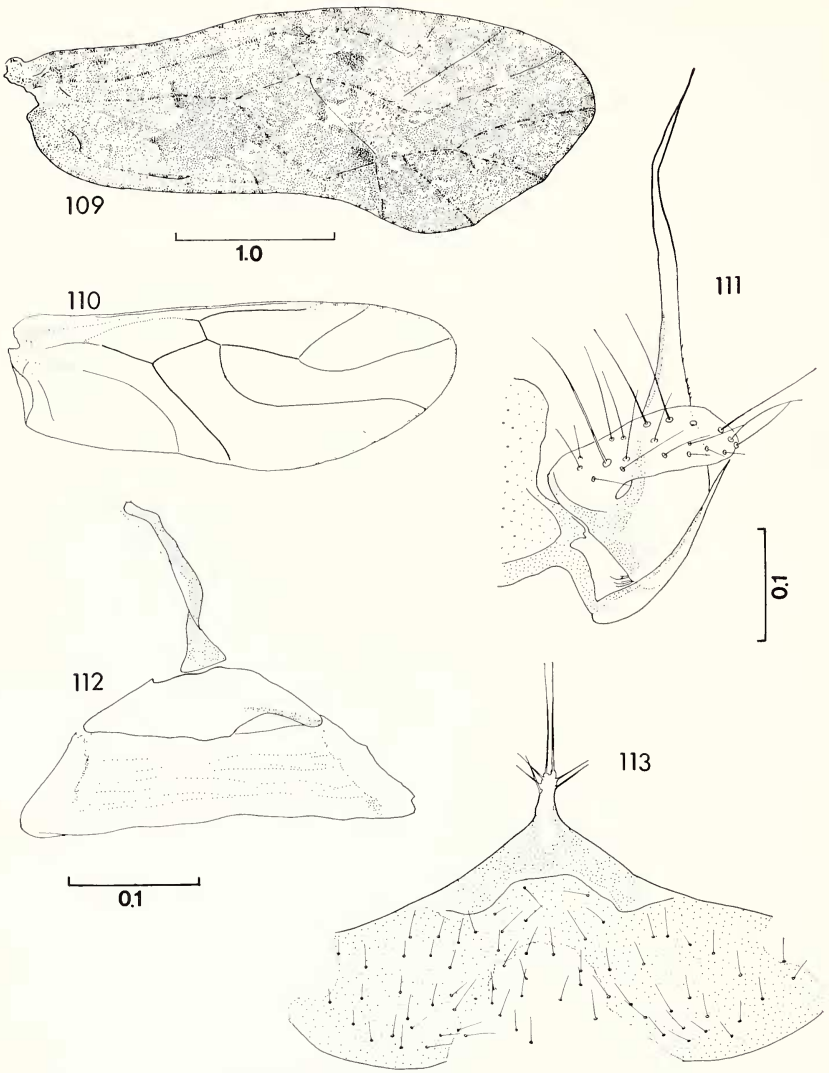
DIAGNOSIS: Similar to *P. antillanus*. Tarsi and femora same as in that species except subapical pale ring of each femur wider. Pterostigmal spur and outpocketings of vein IA same as in that species. Forewing margin smooth, not protruding at tips of veins M_2 and M_3.

Measurements:

FW	T	t_1	t_2	t_3	$t_1$ct	IO	D	d	IO/D	PO
4.12	1.46	0.47	0.07	0.09	19	0.52	0.36	0.29	1.46	0.79

←

FIGS. 103–108. Structures of *Phlotodes minutus*, new species. Fig. 103. ♂ forewing. Fig. 104. ♂ phallosome, scale of Fig. 107. Fig. 105. ♂ hypandrium. Fig. 106a. ♂ Epiproct, b. ♂ paraproct, c. ♂ posterior middorsal region of clunium, scale of Fig. 107. Fig. 107. ♀ Gonapophyses. Fig. 108. ♀ Subgenital plate, half scale of Fig. 107.



FIGS. 109–113. Structures of *Phlotodes antillanus*, new species ♀. Fig. 109. Forewing. Fig. 110. Hindwing. Fig. 111. Gonapophyses. Fig. 112. Ninth sternum. Fig. 113. Subgenital plate, half scale of Fig. 112.

MORPHOLOGY: In forewing, Rs and M joined at a point; M connected to areola postica by short crossvein. Distal margin and anal vein of forewing as indicated in diagnosis.

Terminal abdominal segments—Subgenital plate (fig. 117) with

distal piece as described for *P. antillanus* except bearing in addition to the two terminal macrosetae six smaller subterminal setae, four on one side, two on other. Gonapophyses (fig. 116) typical of genus; first valvula acuminate, much longer than in *P. antillanus*, set at approximately right angle to its stem; second valvula very slender; third valvula developed as in *P. antillanus* except outer margin in middle beset with several setae. Ninth sternum bearing long, curved sclerite (fig. 115) decidedly widened in middle behind rim of apparent spermathecal opening; rim bearing anteriorly pair of long, diverging, sclerotized arms. Epiproct as in *P. antillanus*, likewise paraproct except 25–28 trichobothria in sense cushion.

COLOR (in alcohol): Compound eyes purple mottled with darker purple. Head generally creamy yellow liberally marked with irregular purplish brown spots. Prominent spot of this color on gena below each compound eye, on postclypeus at its anterior margin and in middle of each parietal region. Labrum and anteclypeus medium brown. Thorax dorsally mottled creamy yellow and medium brown with purplish brown along sutures. Thoracic pleura mostly creamy yellow mottled with purplish brown, mostly in upper halves. Coxae medium dark brown; all femora same color except for wide subapical pale ring continuing ventrally to tip. All tibiae light brown on basal two thirds darkening from base outward, followed by a dull white ring, followed by a medium dark brown tip. All t_1's brown at base, dull white for remainder; all t_2's and t_3's medium brown. Forewing as in figure 114, hindwing as in *P. antillanus*. Abdominal color poorly preserved.

HOLOTYPE ♀: Las Villas Prov.: Topes de Collantes, Sierra de Trinidad, June 11, 1959, M.W.S.

KEY TO THE GENERA AND SPECIES OF CUBAN MYOPSOCIDAE

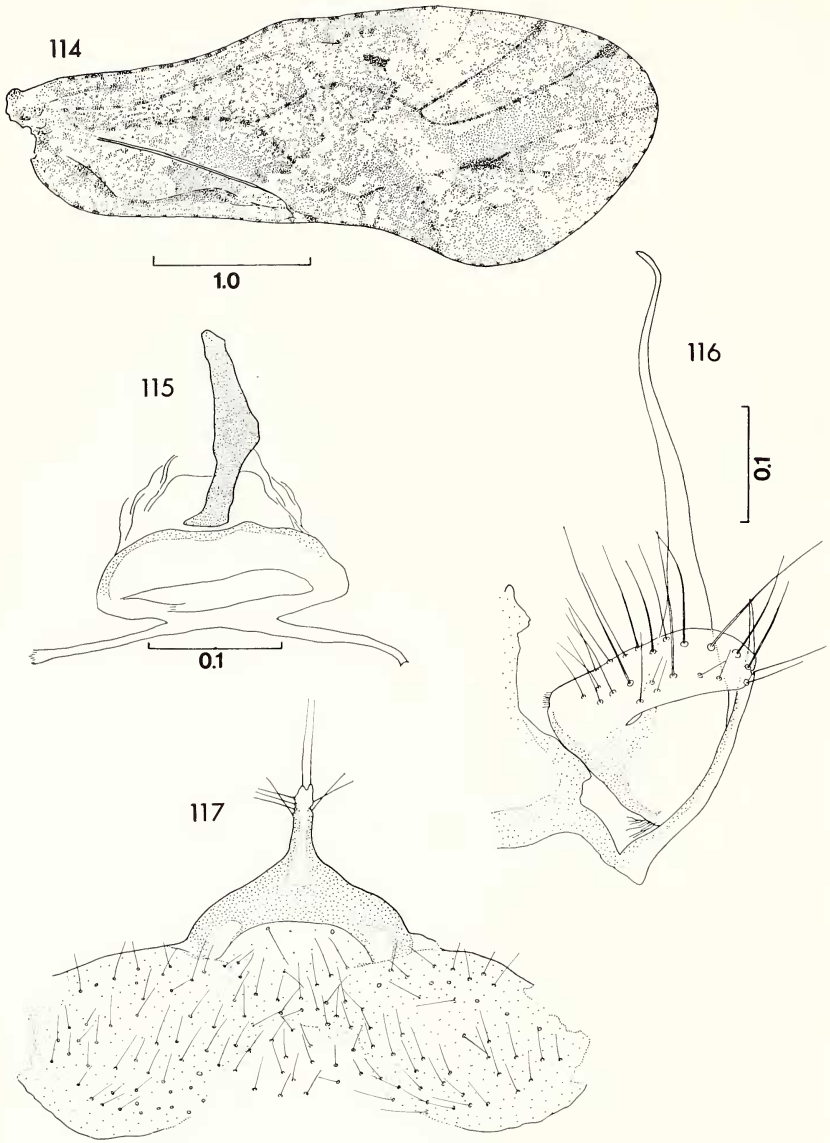
1. In hindwings Rs and M joined by crossvein. Female subgenital plate terminating distally in a broadly truncated piece ..... *Myopsocus* 2

   In hindwing Rs and M fused for short distance. Female subgenital plate terminating distally in tapering piece bearing two setae on its narrow tip ..... *Phlotodes* 3

2. Posterior femur uniformly dark brown ..... *M. clypeofasciatus*, new species

   Posterior femur dark brown only in series of spots on its dorsal surface, otherwise pale brown to creamy white ..... *M. sparsus* (Hagen) (?)

3. Forewing bearing two distinct outpocketings along vein IA. Posterior femur predominantly brown 4



FIGS. 114–117. Structures of *Phlotodes cubanus*, new species ♀. Fig. 114. Forewing. Fig. 115. Ninth sternum. Fig. 116. Gonapophyses. Fig. 117. Subgenital plate, half scale of Fig. 115.

Outpocketings along vein IA of forewing scarcely discernible. Posterior femur predominantly creamy yellow ..... *P. minutus*, new species

4. Forewing margin protruding at tips of veins M_2 and M_3 ..... *P. antillanus*, new species

Forewing margin smooth, not protruding at tips of veins M_2 and M_3 ..... *P. cubanus*, new species

FAMILY PSOCIDAE ENDERLEIN

SUBFAMILY CERASTIPSOCINAE BADONNEL

Metylophorus species

A single teneral female is the only representative of this species in the material. It is smaller than any of the species known from the United States and Mexico. The genus has not been recorded previously in the West Indies.

RECORDS: Oriente Prov.: Cupeyal, Yateras, June, 1964, F.Z.

Cerastipsocus cubanus Enderlein

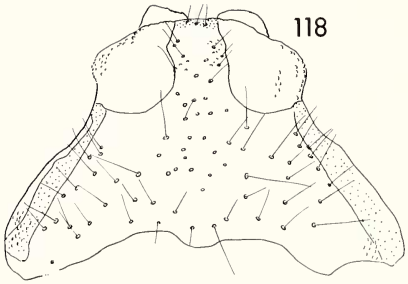
C. cubanus Enderlein, 1919, p. 34.

DIAGNOSIS: A fumose winged species, differing from *C. venosus* (Burmeister) (United States) by having pterostigma deeper and, in male, antennal f_1 somewhat thickened and densely hairy. Differing from *C. sivorii* Ribaga by lack of pale crescent-shaped mark in basal third of forewing. Differing from *C. acraceocristatus* (Enderlein) by lack of pair of elongate processes on distal end of hypandrium. Details of other named fumose winged species not known.

The following description of terminal abdominal structures augments Enderlein's description and measurements.

Male: Hypandrium (fig. 118) symmetrical, its sides strongly sclerotized, the sclerotization ending well before apex; central strongly sclerotized and pigmented band along midline to apex flanked on each side by clear, less sclerotized area bearing lateral granulations; more strongly sclerotized portions of hypandrium beset with setae. Phallosome (fig. 119) a closed frame rounded and bearing small anterior projection basally; near base with small projection on each side; apex granular. Epiproct (fig. 120) pentagonal with base and distal sides long, bearing setae along free edges and across middle. Tip of paraproct as in figure 121.

Female: Subgenital plate (fig. 124) with usual pigment and setal distribution for genus. Gonapophyses as in figure 123. Epiproct (fig. 122) approximately triangular with apex rounded; base colorless (weakly sclerotized) in middle and at sides; colorless oval region in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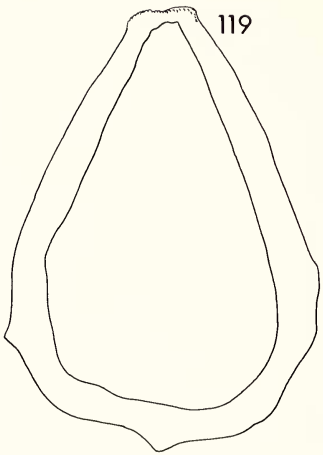
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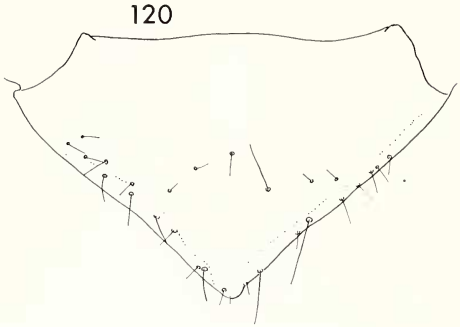
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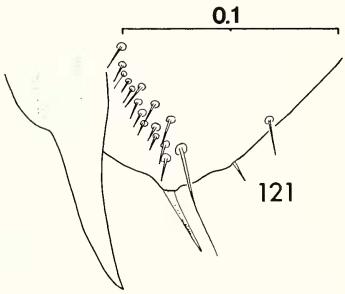
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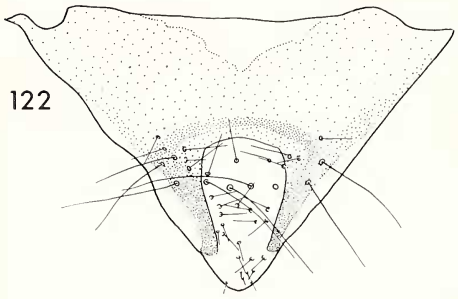
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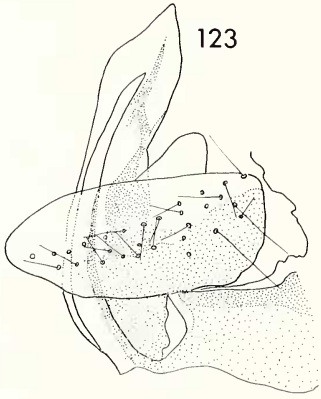
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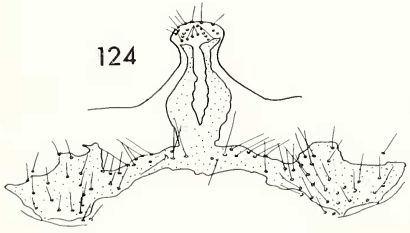
124

apex bordered laterally and anteriorly by strongly sclerotized rim with straight sides; arched row of eight macrosetae across epiproct distad of middle; scattered smaller setae distad of middle.

RECORDS: Las Villas Prov.: Sierra de Trinidad, Topes de Collantes, June 11, 1959, 1 ♀, M.W.S. Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, 1 ♀, 8 nymphs, M.W.S.; Gran Piedra nr. Santiago, May 30–31, 1959, 1 ♀, M.W.S.; Loma del Gato, Sierra Maestra, May 26–28, 1959, 13 nymphs, M.W.S.; Turquino, Pico Cuba, Sierra Maestra, June, 1963, 2 ♂, 4 ♀, F. Z. Pinar del Río Prov.: Soroa, Apr., 1964, 1 ♀, F.Z.; July, 1966, 1 ♀, F.Z.

DISCUSSION: Enderlein's description compares the species with its close relative *C. venosus* (Burmeister) and is sufficient to separate the two. Hagen's (1861) record of *C. venosus* from Cuba probably refers to this species.

SUBFAMILY PSOCINAE BADONNEL

Aside from a single species of *Trichadenotecnum* and one of *Ptycta*, all of the Cuban material belongs to a species group currently within *Psocidus* which includes the described North American species *P. bisignatus* (Banks), *P. insulanus* (Chapman), *P. infumatus* (Banks), and *P. texanus* (Aaron). At risk of creating a synonym of the poorly defined genus *Copostigma* Enderlein (including *Clematostigma* Enderlein and *Mecampsis* Enderlein as subgenera according to Roesler, 1944), I am creating a new genus for this species group.

Indiopsocus, new genus

TYPE SPECIES: *Psocus texanus* Aaron.

DIAGNOSIS: Differing from type species of *Psocidus*, *P. zanzibarensis* Pearman, in having phallosome closed anteriorly; hypandrium bearing median sclerotized ridge generally asymmetrical. A pair of rounded sclerites anterior to hypandrium. Differing from other genera of Psocinae in which external genitalic features are known [complex of *Ptycta* Enderlein and *Maheela* Enderlein, *Atlantopsocus* Badonnel,

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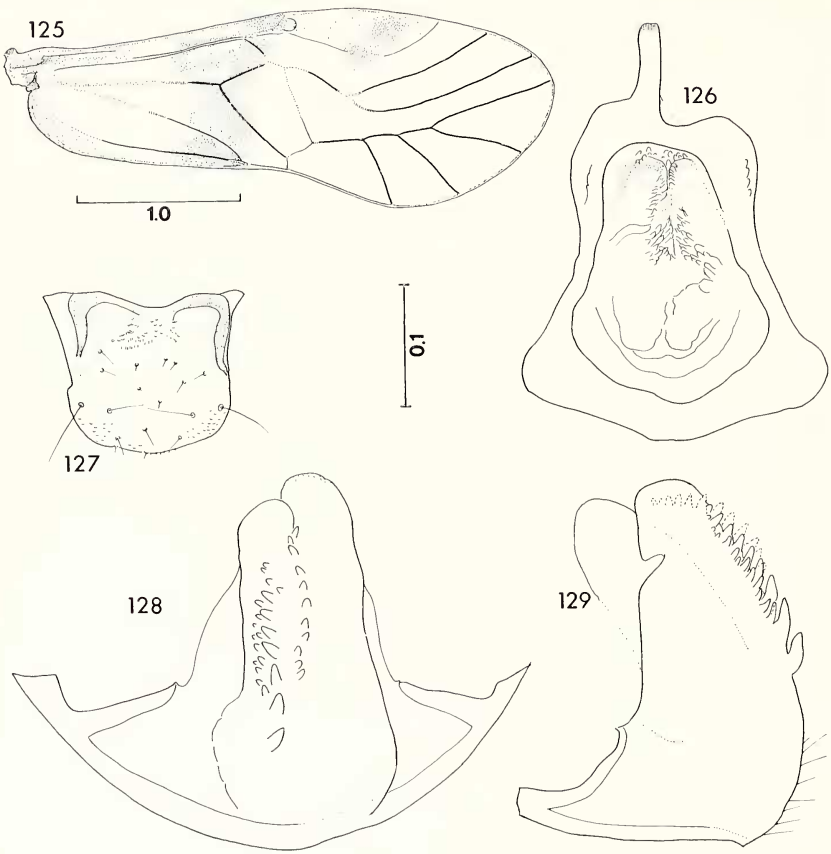
FIGS. 118–124. Structures of *Cerastipsocus cubanus* Enderlein. Fig. 118. ♂ hypandrium, scale of Fig. 123. Fig. 119. ♂ phallosome, half scale of Fig. 121. Fig. 120. ♂ epiproct, half scale of Fig. 121. Fig. 121. Distal end of ♂ paraproct. Fig. 122. ♀ epiproct, scale of Fig. 123. Fig. 123. ♀ gonapophyses. Fig. 124. ♀ subgenital plate, half scale of Fig. 123.



FIGS. 125–129. Structures of *Indiopsocus cubanus* (Banks) ♂. Fig. 125. Forewing. Fig. 126. Phallosome. Fig. 127. Epiproct. Fig. 128. Hypandrium, ventral view. Fig. 129. Hypandrium, lateral view.

Camelopsocus Mockford, *Hyalopsocus* Roesler, *Oreopsocus* Roesler, *Neopsocus* Kolbe, *Psocus* Latreille (restricted by Pearman, 1932), *Trichadenotecnum* Enderlein] by having phallosome broad basally, at least as broad at base as in middle, generally broader. Differing from *Steleops* Enderlein (including *Pelmatocoria* Enderlein as subgenus according to Roesler, 1944) in absence of any tendency for eyes to be stalked.

Distal process of female subgenital plate always with lateral sclerotization on or near each edge, generally running lengthwise.

Indiopsocus cubanus (Banks), new combination

Psocus cubanus Banks, 1908, p. 257.
Psocidus cubanus (Banks): Smithers, 1967, p. 107.

DIAGNOSIS: Separable from other Cuban species of the genus by characters in key following descriptions.

REDESCRIPTION (based on examination of holotype and two additional specimens):

Male. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3378	1352	482	174	25	0.28	0.44	0.35	0.63	0.79

MORPHOLOGY: Forewing (fig. 125) with pterostigma of medium depth, bordered by distinct *stigmasaum* from base to posterior apex; Rs and M joined a relatively long distance; Rs fork long, originating basal to M-Cu_{1a} fork; Cu_{1a} before joining median much shorter than segment of the joined veins.

Terminal abdominal segments—Posterior margin of clunium heavily sclerotized before epiproct and paraprocts; this strip widest before paraprocts. Hypandrium (figs. 128, 129) beyond base forming asymmetrical sclerotized strap bilobed at apex, left lobe twisted leftward and bearing lengthwise two rows of elongate teeth, left row irregular and in part flanked by smaller teeth; this row reaching further basad than right, the latter reaching further distad than left. Phallosome (fig. 126) roughly a four sided figure with base broader than apex; corners widened; on apical margin to left of middle a slender, truncated, slightly curved process. Paraproct with field of papillae laterally. Epiproct (fig. 127) approximately quadrate, about half length of paraproct; edges of basal corners heavily sclerotized.

COLOR (in alcohol): Compound eyes purplish gray. Body in general creamy yellow marked with medium brown and purplish brown. Vertex with brown spots along posterior margin, along midline not quite reaching ocelli, also some brown spots bordering compound eyes; frons with brown V-shaped mark extending forward from ocellar interval; each arm of V broadened laterally at about half its length; postclypeus bearing distinct brown striations, these not reaching anterior margin. Antennae (incomplete) medium brown. Thoracic nota and pleura medium brown, paler along sutures. Coxae and tarsi brown; remainder of legs dull white with faintly indicated dusky band around end of each anterior and middle femur. Forewing (fig. 125) with transverse band before middle broad, somewhat broken in radial cell, reaching anterior wing margin only at base of pterostigma. Pterostigma brown only in distal half, the mark not reaching distal

end of cell; *stigmasaum* and membrane posterior to it brown only around posterior apex of pterostigma. Cell IA brown in basal third. Remainder of wing clear. Hindwing with faint brown region along anterior margin in middle and another in distal end of cell Cu_2, otherwise clear. Preclunial abdominal segments white, faintly banded with purple. Clunium, epiproct, and paraprocts pale brown; hypandrium and pair of sclerites anterior to it medium brown.

Female. Measurements:

FW	T	t_1	t_2	t_1ct	IO	D	d	IO/D	PO
3397	1351	454	178	22	0.45	0.32	0.23	1.40	0.71

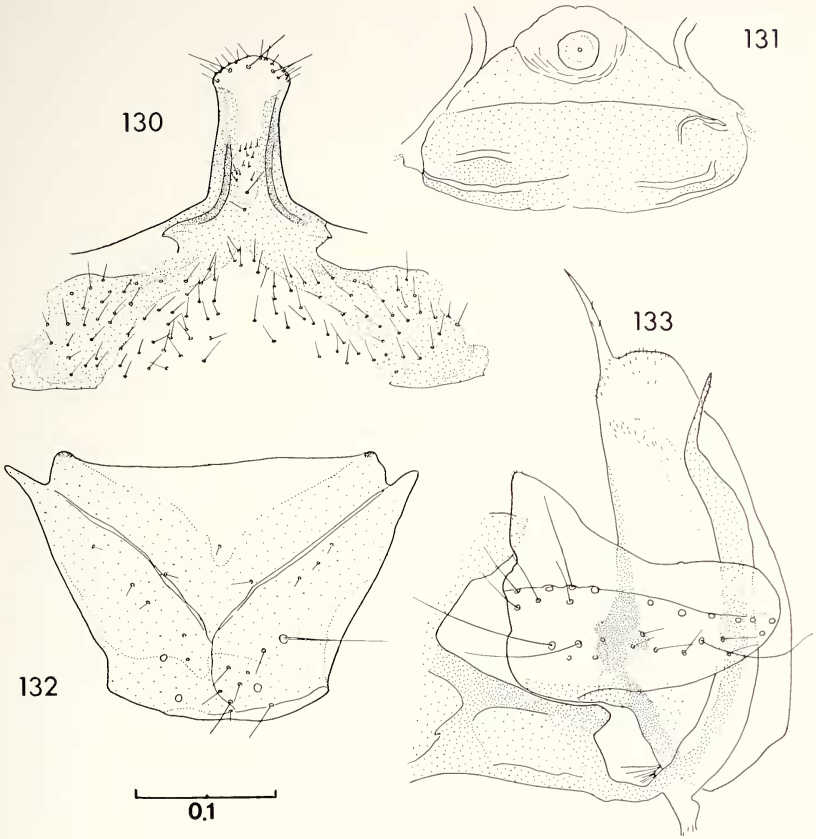
MORPHOLOGY: Forewing much as in male but Rs-M junction somewhat shorter, Rs fork somewhat shorter and about equally distant from wing base as M-Cu_{1a} fork.

Terminal abdominal segments—Subgenital plate (fig. 130) with distal process slightly expanded laterally at apex and bearing there several setae including three longer than others; heavily sclerotized strip bordering each side of process curving outward and ending to sides of base of process; pigmented basal area forming pair of arms expanded laterally. Gonapophyses (fig. 133): first valvula slender, recurved before apex, recurved portion bearing several minute, backward directed spines; second valvula straight, bearing slender, straight, acuminate process distally and numerous minute spines around base of process; third valvula with row of macrosetae across middle and several setae of various lengths basal to row; distal lobe conical; length from attachment to end of distal lobe less than length across base of valvula. Ninth sternum (fig. 131) bearing transverse elliptical sclerite of ropy texture anterior to spermapore. Paraprocts normal for subfamily; sense cushions each with 26 trichobothria. Epiproct (fig. 132) roughly quadrate with base broader than apex; in distal half, two macrosetae on each side and scattered smaller setae over surface.

COLOR (in alcohol): Generally same as in male, differing in possessing purple spot to each side of V-shaped mark on frons and in having smaller distal brown spot of pterostigma.

RECORDS: Habana Prov.: Habana, holotype ♀, Baker (in Museum of Comparative Zoology, Cambridge, Massachusetts). Oriente Prov.: Cupeyal, Yateras, June, 1965, 1 ♂, 1 ♀, F.Z.

NOTE: The female genitalic figures (figs. 130–133) are based not on the type but on the specimen collected by Zayas. This specimen differs from the type as follows: (1) the distal process of the subgenital plate is slightly longer and more slender; (2) the second valvula is broader at the base of its distal process. Although the possibility of specific distinction is remote, it cannot be dismissed altogether.



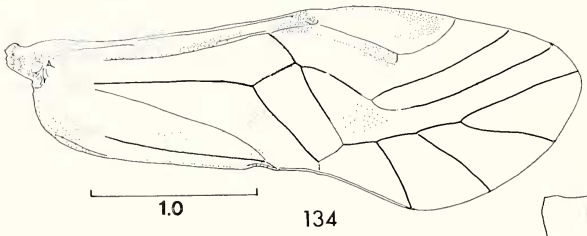
FIGS. 130–133. Structures of *Indiopsocus cubanus* (Banks) ♀. Fig. 130. Subgenital plate, half scale of Fig. 132. Fig. 131. Ninth sternum, scale of Fig. 132. Fig. 132. Epiproct. Fig. 133. Gonapophyses, scale of Fig. 132.

Indiopsocus texanus (Aaron), new combination

Psocus texanus Aaron, 1886, p. 16.
Psocidus texanus (Aaron): Smithers, 1967, p. 111.

DIAGNOSIS: Differing from other Cuban species of genus as indicated in key.

This species was described adequately by Chapman (1930). It occurs around the Gulf Coast of the United States from Texas to



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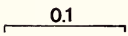

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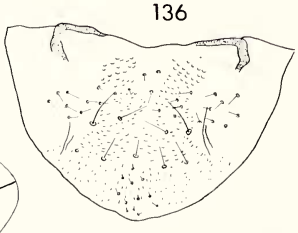

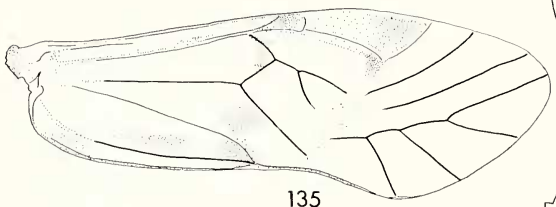

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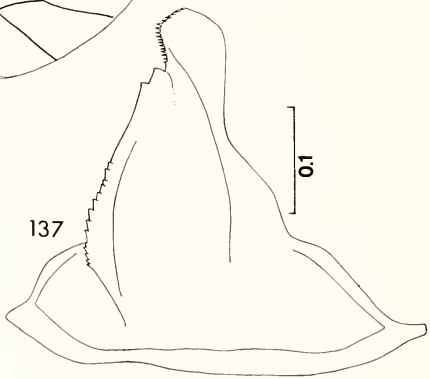

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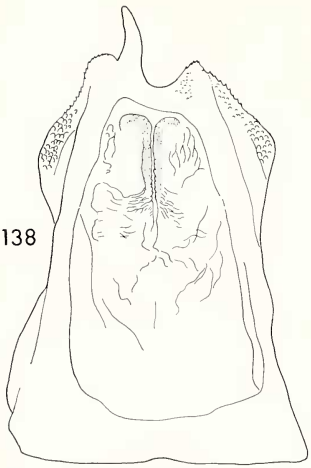

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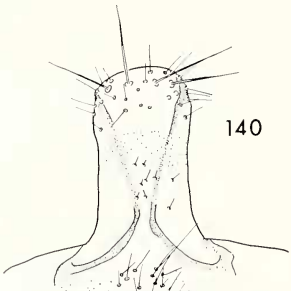

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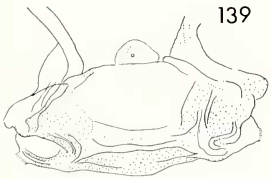

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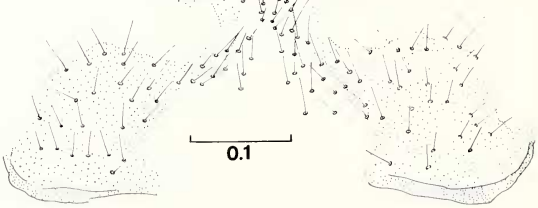

Florida and up the Atlantic Coast to Long Island. It has not previously been recorded from the West Indies.

RECORDS: Habana Prov.: Jibacoa, March, 1962, 4 ♂, F.Z.; Marianao, Nov., 1966, 3 ♂, 10 ♀, F.Z. Oriente Prov.: Mocambo w. of Imías, June 1, 1959, 1 ♂, M.W.S.

Indiopsocus ubiquitus, new species

DIAGNOSIS: Very similar to *I. texanus* (Aaron), but differing as indicated in key.

Male. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3560	1539	544	176	30	0.28	0.45	0.39	0.61	0.86

MORPHOLOGY: Forewing (fig. 134): pterostigma of medium depth with spur vein from posterior apex and vague *stigmasaum* from base to spur vein. Rs and M fused a short to medium distance. Rs fork long, originating slightly before M-Cu_{1a} fork. Segment of Cu_{1a} before junction with M slightly shorter than joined section.

Terminal abdominal segments—Hypandrium (fig. 137) beyond base broad sclerotized asymmetrical strap bent left at apex; on left side recurved row of short teeth ending after describing arc mesially and back out to side at about three-fourths distance from base to apex; this row paralleled distally by ridge ending on side just distad of tooth row; ridge near right margin running most of length of hypandrium becoming dentate near apex; second ridge median to this one, also dentate near apex. Phallosome (fig. 138) a quadrate frame with base broader than apex; basal corners widened, distal corners enlarged as lateral flanges with surfaces denticulate; curved, acuminate process arising on apex left of middle plane. Paraproct with rough sculpture on side; distal spur short, terminating in slender point. Epiproct (fig. 136) about half length of paraproct, semicircular; at base to each side of midline an angled heavily sclerotized strip; most of surface covered with minute denticles.

COLOR (in alcohol): As described for *I. cubanus* but differing as follows: brown spots along midline of vertex reaching ocellar

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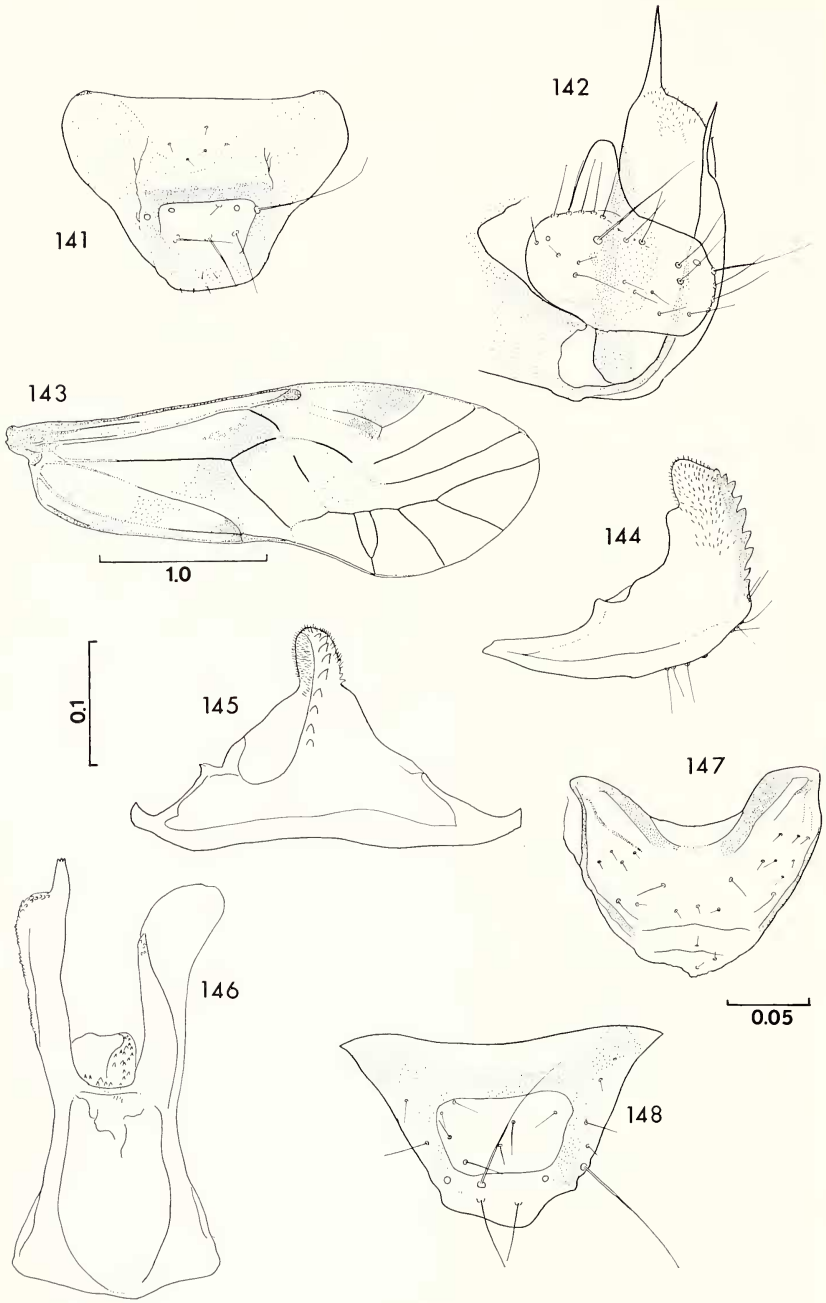
FIGS. 134–140. Structures of *Indiopsocus ubiquitus*, new species. Fig. 134. ♂ forewing. Fig. 135. ♀ forewing. Fig. 136. ♂ epiproct. Fig. 137. ♂ hypandrium, ventral view. Fig. 138. ♂ phallosome, scale of Fig. 136. Fig. 139. ♀ ninth sternum, scale of Fig. 136. Fig. 140. ♀ subgenital plate.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interval and forming brown ring around it. Dusky bands around femora subterminal and present on each femur. Tibiae white. Forewing (fig. 134) with transverse brown band before middle restricted to borders of veins plus spot in cell Cu_{1b} and nodular spot in cells Cu_2 and IA. In cell Cu_2 another spot just distad of middle.

Female. Measurements:

FW	T	t_1	t_2	t_1ct	IO	D	d	IO/D	PO
3357	1377	485	166	27	0.41	0.29	0.22	1.41	0.75

MORPHOLOGY: Forewing as in male.

Terminal abdominal segments—Subgenital plate (fig. 140) having distal process beset at tip with numerous short setae and four longer ones; pair of slender sclerotized strips traversing process, broken in middle, converging toward base of process then curving outward and terminating to sides of base of process; pigmented basal area of plate forming pair of curved arms expanded laterally. Gonapophyses (fig. 142) as described for *I. cubanus* but first valvula somewhat widened in middle. Ninth sternum (fig. 139) with round spot at spermapore and some sinuous sclerotizations anterior to it. Paraprocts normal for subfamily; sense cushions with 20–21 trichobothria. Epiproct (fig. 141) truncate apically, base much broader than apex; quadrate region outlined in heavy sclerotization set in distal half and including two transverse rows of macrosetae, three in more basal, four in more distal row.

COLOR (in alcohol): Same as in male, but transverse band of forewing (fig. 135) better developed.

HOLOTYPE ♂, allotype ♀, 4 ♂ and 2 ♀ paratypes: Oriente Prov.: Gran Piedra nr. Santiago, May 30–31, 1959, M.W.S.

PARATYPES: Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, 3 ♂; Loma del Gato, Sierra Maestra, May 26–28, 1959, 2 ♂, 6 ♀; n. of Sabanilla, June 2, 1959, 1 ♂, M.W.S.; Palma Sola, Sierra Maestra, June, 1965, 1 ♂, F.Z.

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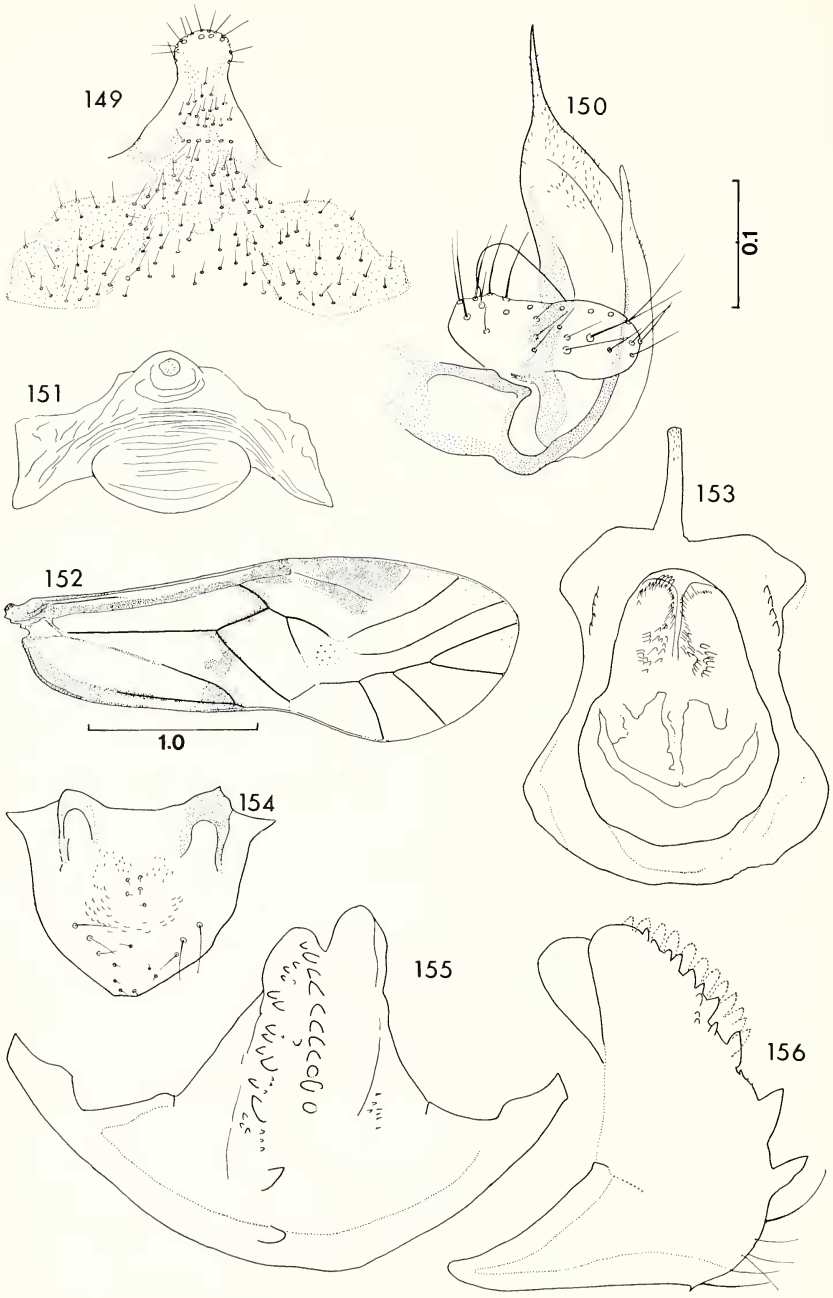
FIGS. 141–148. Structures of Cuban *Indiopsocus*. Fig. 141. *I. ubiquitus*, new species ♀, epiproct, scale of Fig. 145. Fig. 142. *I. ubiquitus*, new species ♀, gonapophyses, scale of Fig. 145. Figs. 143–148. *I. affinis*, new species. Fig. 143. ♀ Forewing. Fig. 144. ♂ hypandrium, lateral view, scale of Fig. 145. Fig. 145. ♂ hypandrium, ventral view. Fig. 146. ♂ phallosome, scale of Fig. 145. Fig. 147. ♂ epiproct. Fig. 148. ♀ epiproct, scale of Fig. 145.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Indiopsocus affinis, new species

DIAGNOSIS: Differing from other Cuban species of the genus by characters in key. Very similar to *I. insulanus* (Chapman), but differing in details of hypandrium and phallosome.

Male. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
—	1100	405	131	20	0.26	0.34	0.29	0.76	0.84

MORPHOLOGY: Forewing represented by fragment. Rs and M fused a short distance; *stigmasaum* present from base of pterostigma presumably to posterior apex.

Terminal abdominal segments—Posterior margin of clunium heavily sclerotized on each side of middle before base of paraproct and lateral corner of epiproct. Hypandrium (figs. 144, 145) triangular, bearing longitudinal row of 11 teeth on ridge up middle to apex of triangle; surface well sclerotized to right of ridge, weakly sclerotized to left; apex of triangle densely beset with minute spines and denticles to about half-way down row of teeth. Phallosome (fig. 146) a four sided figure broader basally than distally; margin expanded at basal corners and very weak in middle at base; at each distal corner bearing posteriorly directed process, left one sharply constricting near apex to terminate as blunted point; right one thumb-shaped and bearing diagonal ridge on upper surface; outer margin of left process and ridge of right process denticulate. Paraproct with distal spur elongate, curved, acuminate-tipped. Epiproct (fig. 147) about half length of paraproct, dome-shaped, bearing heavily sclerotized arch in basal half; sides of arch at base extending laterally to lateral margins.

COLOR: Specimen not in suitable condition for color determination; color apparently similar to that of female.

Female. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3197	1216	414	137	19	0.37	0.26	0.19	1.43	0.75

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FIGS. 149–156. Structures of Cuban *Indiopsocus*. Figs. 149–151. *I. affinis*, new species ♀. Fig. 149. Subgenital plate, half scale of Fig. 150. Fig. 150. Gonapophyses. Fig. 151. Ninth sternum, scale of Fig. 150. Figs. 152–156. *I. camagueyensis*, new species ♂. Fig. 152. Forewing. Fig. 153. Phallosome, scale of Fig. 150. Fig. 154. Epiproct, scale of Fig. 150. Fig. 155. Hypandrium, ventral view, scale of Fig. 150. Fig. 156. Hypandrium, lateral view, scale of Fig. 150.

MORPHOLOGY: Forewing (fig. 143) with a long spur vein from posterior apex of pterostigma; *stigmasaum* present from base of pterostigma to spur vein; Rs and M joined a very short distance; segment of Cu_{1a} from fork with Cu_{1b} to junction with M slightly shorter than joined veins; Rs fork long, originating before M-Cu_{1a} fork.

Terminal abdominal segments—Subgenital plate (fig. 149) with distal process slightly expanded and rounded apically, bearing numerous setae on its distal edge; at base of process a weakly defined curved sclerotized band running from near middle of each lateral margin of process; basal pigmented area two curved arms expanded as large quadrate areas anterolaterally. Gonapophyses (fig. 150): first valvula somewhat widened near basal stem, acuminate apically with numerous minute backward directed spines on narrow apical part; second valvula tapering slightly to abruptly narrowed terminal process; process and distal third of valvula bearing minute spines; third valvula with short distal lobe; several scattered setae on basal lobe, including some on its distal margin. Ninth sternum (fig. 151) with transverse oval sclerite anterior to spermapore. Paraproct normal for subfamily, with 19–20 trichobothria on sense cushion. Epiproct (fig. 148) roughly triangular with quadrate region set off by heavily sclerotized margin in distal two-thirds; seven macrosetae and a few shorter setae in or on edges of quadrate region.

COLOR (in alcohol): Compound eyes black. Body in general creamy yellow marked with medium brown, as in *I. cubanus*, differing as follows: thoracic notal lobes brown with broad creamy borders and creamy midline; dusky band at apex of each femur most prominent on posterior femur; in forewing (fig. 143) transverse band before middle of wing broad but broken just before M-Cu_1 fork and again just before vein Cu_2; spot in cell Cu_2 just beyond half its length in addition to distal spot; faint spot in cell R_5 near its base.

HOLOTYPE ♀ AND 1 ♀ PARATYPE: Oriente Prov.: Loma del Gato, Sierra Maestra, May 26–28, 1959, M.W.S.

ALLOTYPE: Oriente Prov.: Gran Piedra nr. Santiago, May 30–31, 1959, M.W.S.

PARATYPES: Oriente Prov., La Siberia, Sierra Maestra, June, 1967, 1 ♀, F.Z. Cuba: no date, 1 ♀, F.Z.

NOTE: The female of *I. insulanus* remains undescribed. For the purpose of comparison with *I. affinis*, it may be characterized briefly as follows: (1) a minute spur vein extends from the posterior apex of the pterostigma; (2) the subgenital plate has lateral pigmented arms that are relatively wide and reinforced underneath by two oval areas of fibrous-appearing thickenings; (3) the distal process of the

subgenital plate has the margins heavily sclerotized laterally at the base of the process, the process lacking a pair of sclerotized curved bands running out to the lateral margins at base; (4) the sclerite of the ninth sternum is concave posteriorly. Comparison with the description of *I. affinis* shows differences in all of these characters.

Indiopsocus camagueyensis, new species

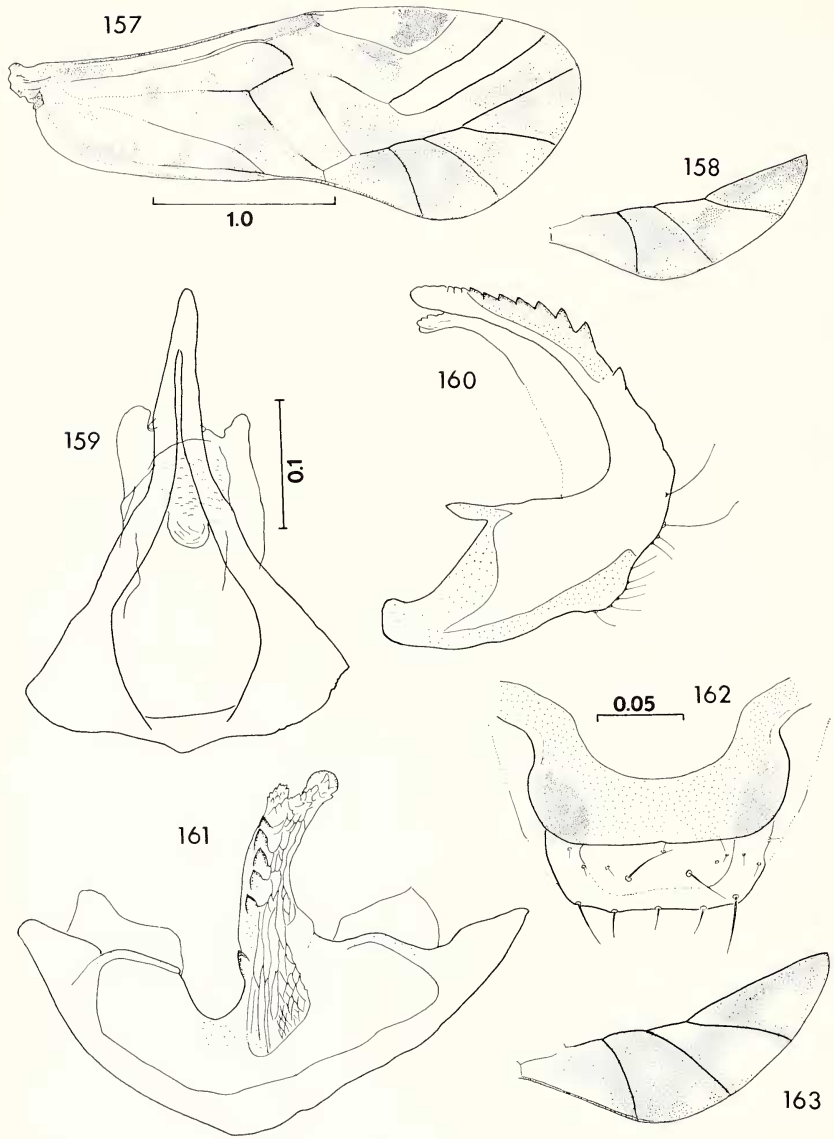
DIAGNOSIS: Very similar to *I. cubanus*, but differing as indicated in key.

Male. Measurements:

FW	T	t_1	t_2	t_1ct	IO	D	d	IO/D	PO
2990	1265	424	138	25	0.29	0.34	0.31	0.84	0.92

MORPHOLOGY: Forewing as described for *I. cubanus*. Terminal abdominal segments—Posterior margin of clunium heavily sclerotized before epiproct and paraprocts, this sclerotized strip much wider than in *I. cubanus* and shallowly but distinctly trilobed on its posterior margin at sites of epiproct and paraprocts. Hypandrium (figs. 155, 156) beyond base forming asymmetrical sclerotized strap and bilobed at apex, left lobe slightly twisted leftward and bearing two longitudinal rows of elongate teeth; left row irregular, in part double, reaching close to base of hypandrium, with basal two teeth very large; right row more regular, extending from apex less than half length of hypandrium, but extending farther apically than left row. Phallosome (fig. 153) roughly a four-sided figure with base somewhat broader than apex; all corners expanded, distal ones more than basals; near distal corner on each side a longitudinal row of four appressed teeth; elongate process, nearly straight, truncated apically arising from distal margin just left of midline. Paraproct with scale-like sculpture laterally; short, rough surfaced process arising from middle of sense cushion. Epiproct (fig. 154) rounded apically; bearing a J-shaped heavy sclerotization at base on each side.

COLOR (in alcohol): Compound eyes dark purple. Body creamy yellow marked with medium brown, markings differing from those described for *I. cubanus* as follows: brown markings of vertex more extensive and solid rather than spotted; those along midline reaching ocelli and continuing around ocellar interval, joining laterally with brown borders of compound eyes, thus isolating creamy yellow patch in each parietal region. Front tibiae medium brown, other tibiae paler. Dusky bands on femora subterminal and present on all femora. In forewing (fig. 152) entire pterostigma brown except for narrow basal region; *stigmasaum* entirely brown, this mark extending back to origin



FIGS. 157–163. Structures of Cuban *Indiopsocus*. Figs. 157–162. *I. variegatus*, new species. Fig. 157. ♂ forewing. Fig. 158. ♀ median region of forewing, scale of Fig. 157. Fig. 159. ♂ phallosome. Fig. 160. ♂ hypandrium, lateral view, scale of Fig. 159. Fig. 161. ♂ hypandrium, ventral view, scale of Fig. 159. Fig. 162. ♂ epiproct and adjacent region of clunium. Fig. 163. *I. dentatus*, new species ♂, median region of forewing, scale of Fig. 157.

of R_1; transverse band before middle of wing restricted to edges of veins, spot in cell Cu_1, and spot at end of cells Cu_2 and IA; cell IA dark in basal half.

HOLOTYPE ♂: Camagüey Prov.: Monte Imías nr. California, June 7, 1959, M.W.S.

Indiopsocus variegatus, new species

DIAGNOSIS: Forewing extensively marked with brown, including transverse band before middle, spots near base, in middle, and in end of cell Cu_2 (subbasal and end spots extending into cell IA), spot in distal half of pterostigma and distally in *stigmasaum*, but also distinct spot in cell R_5 near base and irregular submarginal band through cells R_5, M_1, M_2, M_3, and Cu_{1a}, filling almost completely latter two cells.

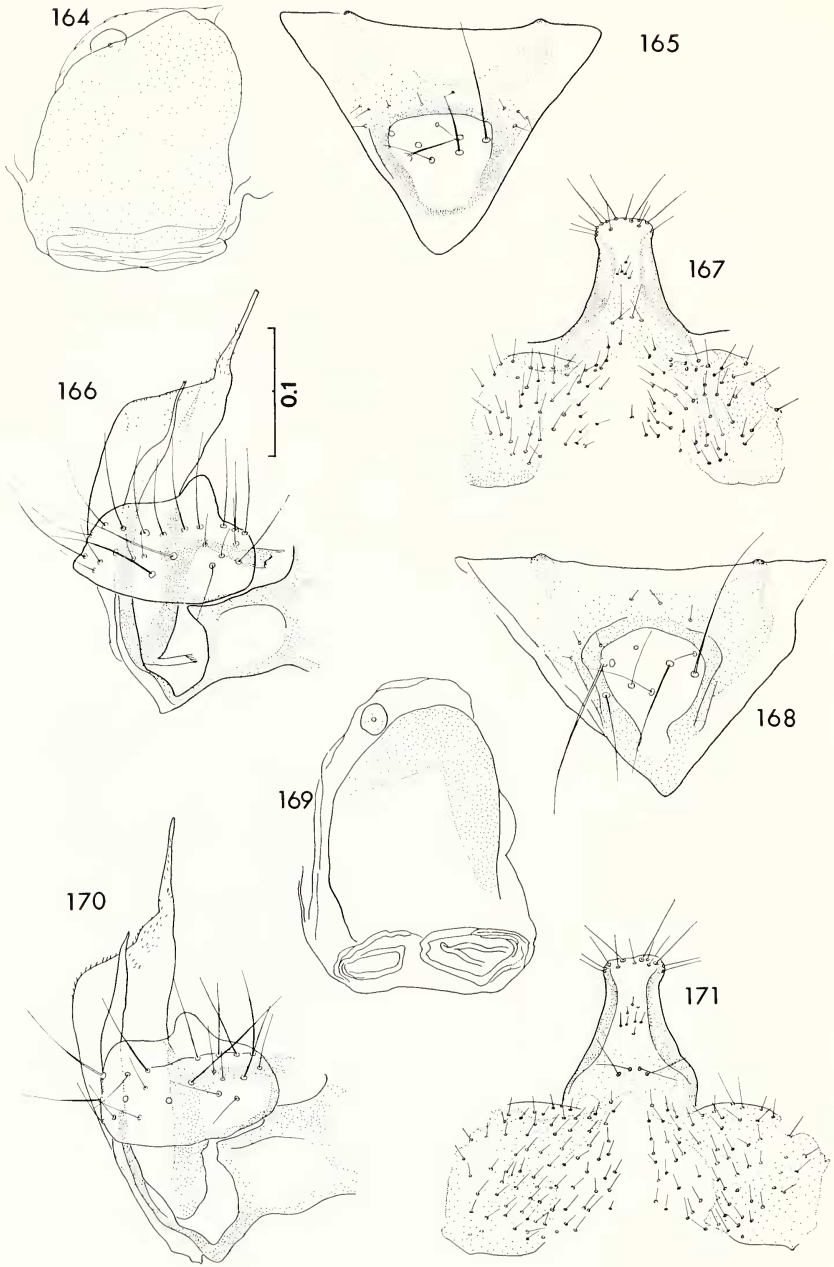
Male. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3147	1251	430	143	22	0.20	0.38	0.29	0.54	0.76

MORPHOLOGY: Forewing (fig. 157) with pterostigma of moderate depth and lacking spur vein; *stigmasaum* from base to posterior apex of pterostigma; Rs and M fused moderate distance; free basal portion of Cu_{1a} only slightly shorter than M-Cu_{1a} fusion, the two vein segments forming nearly straight line.

Terminal abdominal segments—Clunium in middle extending as quadrate shelf over base of epiproct (fig. 162); posterior margin of clunium on shelf and on each side of it beyond paraproct base heavily sclerotized and demarcated by precise line. Hypandrium (figs. 160, 161) beyond base narrow heavily sclerotized nearly symmetrical strap bifid apically and bearing on its median ridge row of teeth becoming much smaller apically and continuing out right lobe of bifid apex; strap to sides of teeth heavily sculptured with reticulate areoles. Phallosome (fig. 159) tapering from broad base to narrow distal apex; sides broad at base; about two-thirds distance from base to tip a pair of membranous lateral expansions slightly sclerotized basolaterally (apparently homologs of sclerotized distal expansions of other species of the genus). Paraproct with lateral heavily sclerotized strip from base to sense cushion; distal prong acuminate apically. Epiproct (fig. 162) quadrate, heavily sclerotized at sides in basal half, bearing row of five setae on posterior margin and two long setae before row.

COLOR (in alcohol): Compound eye color deteriorated; remaining body colors as described for *I. cubanus* except dusky femoral rings submarginal, pronounced, and on each femur. Forewing as described in diagnosis. Hindwing unmarked.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Female. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
2997	1146	391	144	24	0.36	0.25	0.20	1.44	0.81

MORPHOLOGY: Forewing as in male except Rs and M joined at a point.

Terminal abdominal segments—Subgenital plate (fig. 167) with tip slightly expanded and beset with four long setae and several shorter ones; about two-thirds distance from base to tip a group of five small setae; about one-third distance from base to tip a transverse row of four normal setae; process with sclerotized line on each side curving inward from lateral margin at tip, paralleling edge to base, and curving out to near margin at base; basal pigmented area a pair of tenous arms each terminating anterolaterally as a large quadrate area. Gonapophyses (fig. 166) with first valvula sinuously curved from its stem, recurved and exceedingly slender apically; second valvula broad to near tip, rapidly constricting to base of straight apical process; third valvula with short distal lobe; basal lobe with distinct transverse row of setae and numerous setae of different sizes basad of row; inner margin of basal lobe forming small rounded process. Ninth sternum (fig. 164) bearing thick plate before spermapore, plate straight anteriorly and asymmetrically rounded posteriorly. Epiproct (fig. 165) dome-shaped, bearing in distal half a dome-shaped region enclosed anteriorly and laterally by heavily sclerotized edge; this region including several long setae. Paraproct normal for subfamily; sense cushion with 14–15 trichobothria.

COLOR (in alcohol): As described for male except for slight differences in median area of forewing (fig. 158).

HOLOTYPE ♂: Oriente Prov.: Gran Piedra nr. Santiago, May 30–31, 1959, M.W.S.

ALLOTYPE ♀ AND 1 ♀ PARATYPE: Oriente Prov.: Loma del Gato, Sierra Maestra, May 26–28, 1959, M.W.S.

PARATYPES: Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, 2 ♀, M.W.S.

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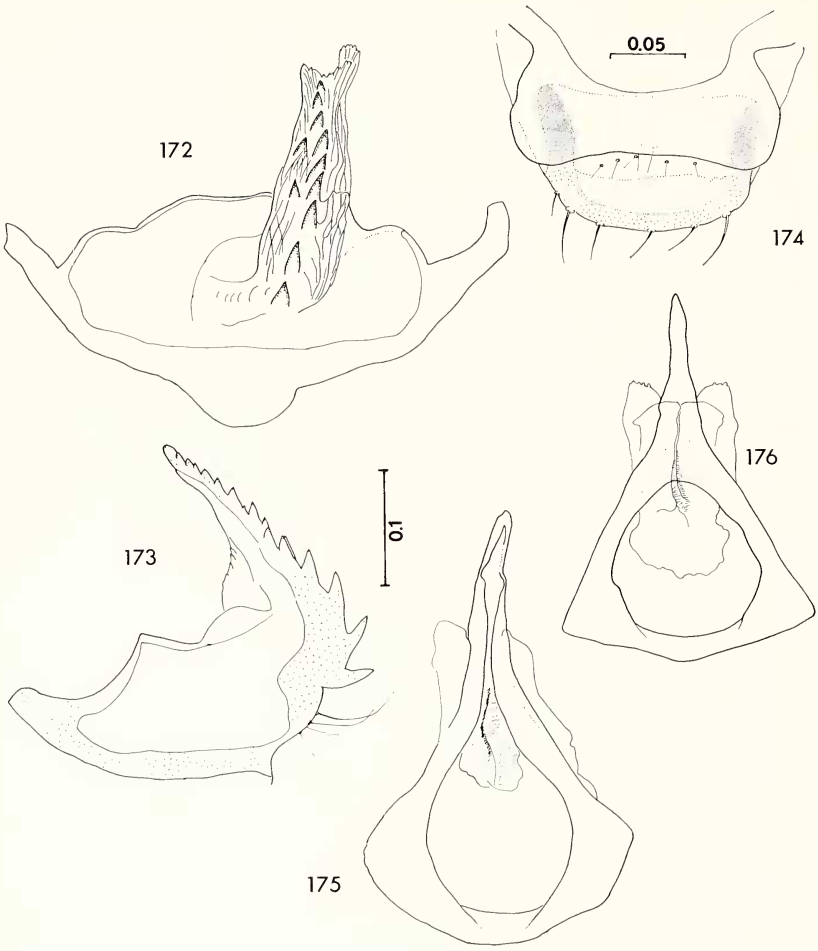
FIGS. 164–171. Structures of Cuban *Indiopsocus*. Figs. 164–167. *I. variegatus*, new species ♀. Fig. 164. Ninth sternum, scale of Fig. 166. Fig. 165. Epiproct, scale of Fig. 166. Fig. 166. Gonapophyses. Fig. 167. Subgenital plate, half scale of Fig. 166. Figs. 168–171. *I. dentatus*, new species ♀. Fig. 168. Epiproct, scale of Fig. 166. Fig. 169. Ninth sternum, scale of Fig. 166. Fig. 170. Gonapophyses, scale of Fig. 166. Fig. 171. Subgenital plate, half scale of Fig. 166.



FIGS. 172–176. Structures of Cuban *Indiopsocus*. Figs. 172–175. *I. dentatus*, new species ♂. Fig. 172. Hypandrium, ventral view, to lower scale. Fig. 173. Hypandrium, lateral view. Fig. 174. Epiproct and adjacent region of clunium. Fig. 175. Phallosome. Fig. 176. *I. microvariegatus*, new species ♂, phallosome, to lower scale.

Indiopsocus dentatus, new species

DIAGNOSIS: Forewings marked almost exactly as in *I. variegatus*, differing primarily in having submarginal brown band much more strongly developed in cell M_1 and M_2 and with distinct colorless spot

in middle of band in cell M_3. Male hypandrium with very large basal teeth on ridge; these absent in *I. variegatus*.

Male. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3526	1325	448	150	24	0.24	0.40	0.32	0.60	0.81

MORPHOLOGY: Forewing (fig. 163) as described for *I. variegatus* except free basal portion of Cu_{1a} equal in length to M-Cu_{1a} fusion.

Terminal abdominal segments—Clunium with shelf over base of epiproct (fig. 174); sides of shelf convex and its posterior margin decidedly concave. Hypandrium (figs. 172, 173) as in *I. camagueyensis* but differing as described in diagnosis. Phallosome (fig. 175) as in *I. variegatus* but membranous lateral expansions not sclerotized basolaterally. Epiproct and paraproct as described for *I. variegatus*.

COLOR (in alcohol): Compound eyes black. Two median postclypeal striations heavier than others; all postclypeal striations darkest across middle, thus forming vague cross on postclypeus. Femoral rings distinct, subapical, brown, on all femora. Otherwise as described for *I. variegatus*, differing only in details of distal band of forewing (fig. 163).

Female. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3406	1257	431	157	22	0.40	0.27	0.18	1.48	0.69

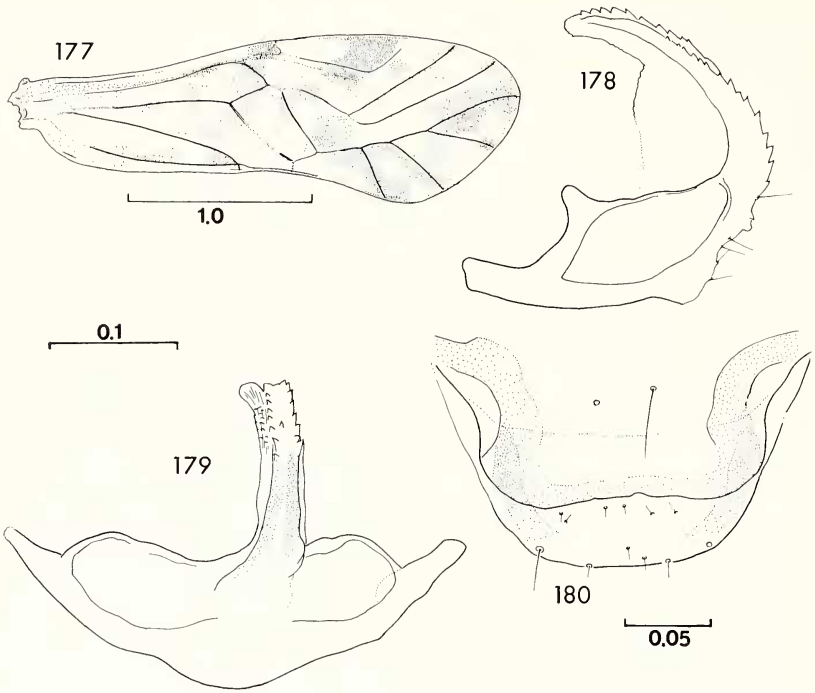
MORPHOLOGY: Almost exactly as described for *I. variegatus*, differing as follows: in forewing Rs and M joined short distance; in subgenital plate (fig. 171), eight short setae in field on distal process at two-thirds distance from base to tip; quadrate anterolateral pigmented areas of plate decidedly emarginate posterolaterally; third valvula of gonapophyses (fig. 170) with exceedingly short distal lobe; sclerite of ninth sternum (fig. 169) not so asymmetrical; sense cushions of paraprocts each with 18 trichobothria. Epiproct as in figure 168.

COLOR (in alcohol): As in male except postclypeal striations not reaching posterior clypeal margin except for one middle striation extending as series of spots to margin; hence cross, though more vague than in male, present on postclypeus.

HOLOTYPE ♂ AND ALLOTYPE ♀: Oriente Prov., Gran Piedra, June, 1967, F.Z.

Indiopsocus microvariegatus, new species

DIAGNOSIS: Forewing (fig. 177) marked almost exactly as in *I. variegatus*, but differing in details of submarginal brown band,



FIGS. 177–180. Structures of *Indiopsocus microvariegatus*, new species ♂. Fig. 177, Forewing. Fig. 178. Hypandrium, lateral view, scale of Fig. 179. Fig. 179. Hypandrium, ventral view. Fig. 180. Epiproct and adjacent region of clunium.

especially brown region in cell M_3 developed as narrow border around large central pale spot; brown regions of band in cell R_5 and M_1 strongly pigmented. Clunial shelf over epiproct concave posteriorly and with angular sides.

Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
2718	1157	408	134	22	0.19	0.32	0.27	0.60	0.86

MORPHOLOGY: Forewing as described for *I. variegatus* except free basal portion of Cu_{1a} decidedly shorter than M-Cu_{1a} fusion, and these two vein segments set at distinct, though slight, angle to each other.

Terminal abdominal segments—Clunium with shelf over epiproct (fig. 180); posterior margin of shelf concave; region bordering pos-

terior margin not demarcated by line from remainder of shelf. Hypandrium (figs. 172, 173) developed as in *I. variegatus* but with two rows of teeth on strap, left-hand row reaching much closer to base of strap than right. Phallosome (fig. 176) and paraproct as in *I. variegatus*. Epiproct approximately semicircular, heavily sclerotized on sides, with setae distributed as in *I. variegatus* (fig. 180).

COLOR (in alcohol): As described for *I. variegatus*, differing as noted in diagnosis and as follows. Purplish brown pigmentation of preclunial abdominal segments mostly confined to sides of segments. Postclypeal striations with middle pair of striae joined to form broad middle band further emphasized by darker line down its center.

HOLOTYPE ♂: Pinar del Río Prov.: Soroa, April, 1967, F.Z.

Indiopsocus pallidus, new species

DIAGNOSIS: Separable from other Cuban species by characters in key.

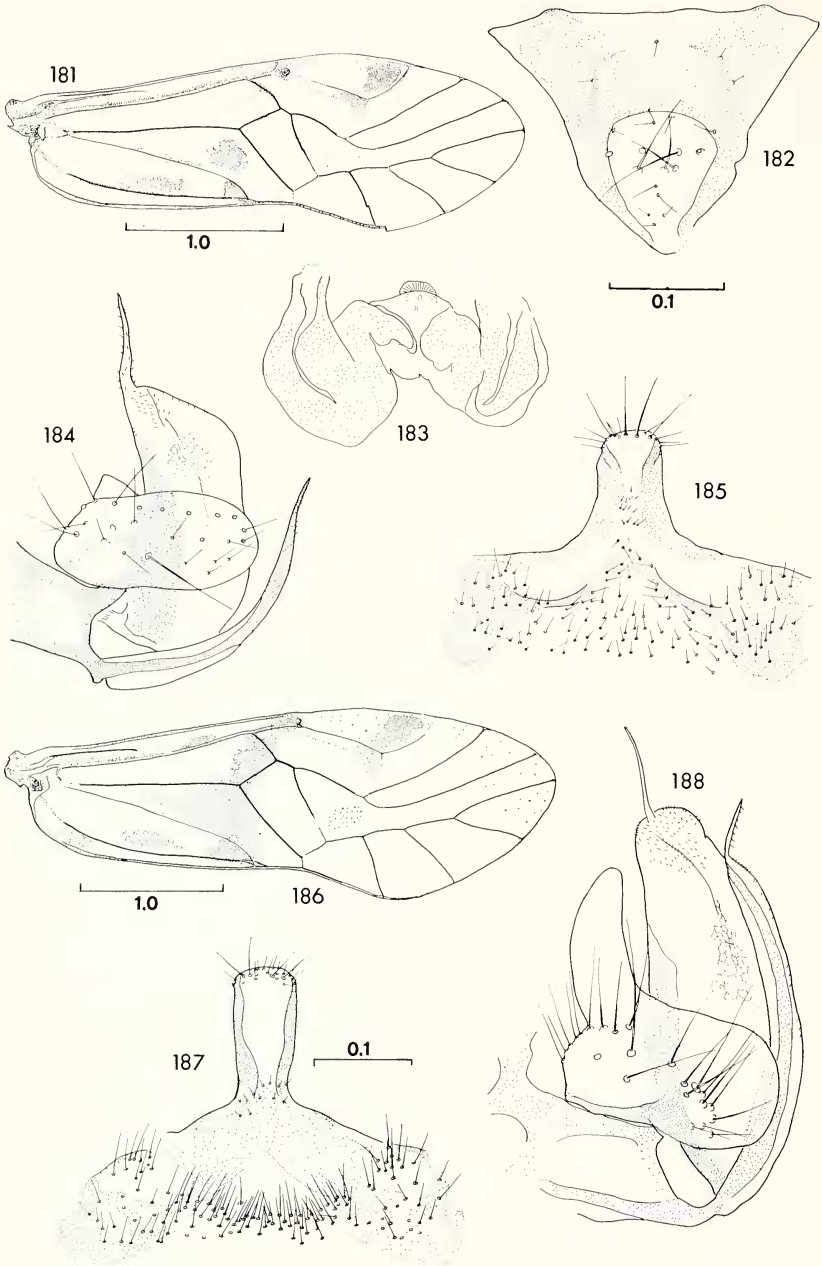
Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3329	1369	464	153	22	0.43	0.33	0.22	1.31	0.67

MORPHOLOGY: Forewing (fig. 181) with pterostigma of moderate depth with short spur vein from posterior apex; Rs and M fused moderate distance; Rs fork long, originating basal to M-Cu_{1a} fork. Free portion of Cu_{1a} very slightly shorter than M-Cu_{1a} fusion.

Terminal abdominal segments—Subgenital plate (fig. 185) with distal process truncated at apex and bearing there four long setae and several shorter ones; sclerotized strip on each side at apex directed basomesially and quickly dissipating; basal pigmented region of plate a pair of slender arms curving laterally and each terminating anterolaterally in quadrate area. Gonapophyses (fig. 184): first valvula slender, curved, with acuminate tip; knob developed at junction of valvula with its stem; second valvula broad, tapering abruptly to acuminate tip, beset with numerous minute spines distally; third valvula with small distal lobe, scattered setae of various lengths on basal lobe. Ninth sternum with a ropy appearing sclerotized region at base of each set of gonapophyses, the two connected by transverse region of similar texture (fig. 183). Paraprocts normal for subfamily; sense cushions with 17–19 trichobothria. Epiproct (fig. 182) triangular, bearing distally a quadrate region outlined by heavily sclerotized rim and including seven long setae.

COLOR (in alcohol): Compound eyes and ocellar interval black. Body in general creamy yellow and medium brown, brown areas much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restricted. Vertex creamy yellow with a few vague purplish brown flecks; a purplish brown spot to each side of ocellar interval; dark brown stripe along each frontal line; frons with usual V-shaped mark in middle and dark brown spot to each side of it; postclypeal striations reduced to rows of spots in transverse band across middle of postclypeus plus middle two striations running as rows of spots the length of sclerite. Pterothoracic terga with medium brown spot on each lobe, spots broadly bordered with creamy yellow. Thoracic pleura largely creamy yellow; anterior coxae likewise; middle and posterior coxae medium brown basally, white distally. Femora and tibiae white but each femur with subapical brown band, band broken dorsally; anterior and middle coxae medium brown, paler posteriorly; posterior first tarsal segment white, second medium brown. Forewing (fig. 181) with transverse brown band before middle represented only by spot at base of pterostigma, narrow border at basal segment of Rs, spot in cell Cu_{1b}, and distal spot in cell Cu_2; middle spot present in latter cell; distal spot of pterostigma small, restricted to distal third of cell; dark brown spot in distal third of *stigmasaum*. Hindwing unmarked. Preclunial abdominal segments partially ringed with brown, on creamy yellow background; rings absent ventrally and mostly broken along four series, one on each side of dorsal midline and one on each side more laterally; rings broad and running together along dorsal midline. Terminal abdominal segments mottled yellow, white, and medium brown.

HOLOTYPE ♀: Pinar del Río Prov.: Soroa, April, 1967, F.Z.

Indiopsocus alticola, new species

DIAGNOSIS: See key to species.

Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3873	1468	493	172	24	0.46	0.32	0.25	1.43	0.77

MORPHOLOGY: Forewing (fig. 186): pterostigma of moderate depth with short spur vein from posterior apex; *stigmasaum* present

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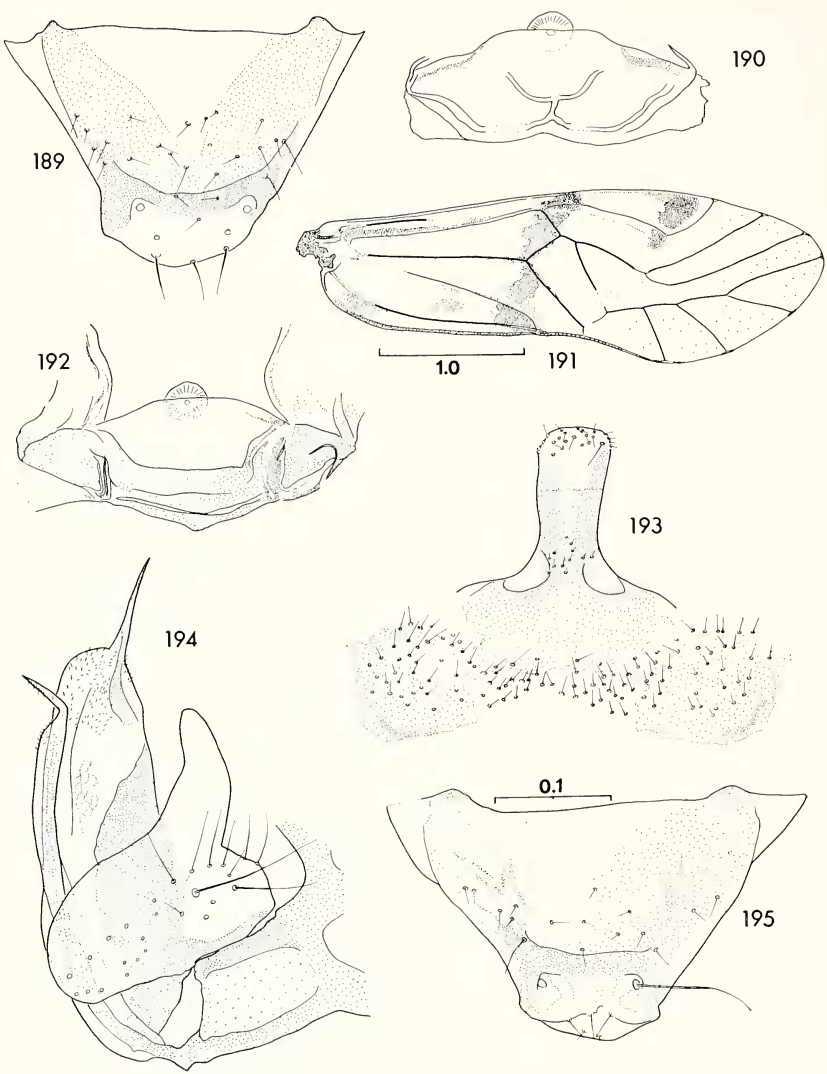
FIGS. 181–188. Structures of Cuban *Indiopsocus*. Figs. 181–185. *I. pallidus*, new species ♀. Fig. 181. Forewing. Fig. 182. Epiproct. Fig. 183. Ninth sternum, scale of Fig. 182. Fig. 184. Gonapophyses, scale of Fig. 182. Fig. 185. Subgenital plate, half scale of Fig. 182. Figs. 186–188. *I. alticola*, new species ♀. Fig. 186. Forewing. Fig. 187. Subgenital plate. Fig. 188. Gonapophyses, scale of Fig. 182.



FIGS. 189–195. Structures of Cuban *Indiopsocus*. Figs. 189–190. *I. alticola*, new species ♀. Fig. 189. Epiproct, scale of Fig. 195. Fig. 190. Ninth sternum, scale of Fig. 195. Figs. 191–195. *I. ceterus*, new species ♀. Fig. 191. Forewing. Fig. 192. Ninth sternum, scale of Fig. 195. Fig. 193. Subgenital plate, half scale of Fig. 195. Fig. 194. Gonapophyses, scale of Fig. 195. Fig. 195. Epiproct.

from base of pterostigma to spur vein; Rs and M fused relatively long distance; first segment of Cu_{1a} shorter than fused M-Cu_{1a}.

Terminal abdominal segments—Subgenital plate (fig. 187) with distal process slightly constricted basally, beset at apex with four long setae and numerous shorter ones, heavily sclerotized laterally, sclerotized strip of each side receding from edge at base of process then curving laterally to meet posterior margin of plate; pigmented basal area as two broad arms each directed anterolaterally and terminating in an irregular broader area; large posteromedian field of plate bare of setae except for very few small ones. Gonapophyses (fig. 188) with first valvula relatively broad, curved, with its acuminate tip recurved; second valvula broad in middle, somewhat narrowing toward apex, rounded apically with long, slender, apical process curved at tip; valvula beset with numerous short spines around base of apical process; third valvula with setose basal lobe reduced, and glabrous distal lobe greatly enlarged as bulbous expansion all along posterior and median margins of basal lobe and extending as long finger-like projection dorsolateral to second valvula. Ninth sternum (fig. 190) with transverse sclerite of ropy pattern around edges anterior to spermapore. Paraproct normal for subfamily, with 22–24 trichobothria on sense cushion. Epiproct (fig. 189) truncated-pyramidal with heavily sclerotized, curved, transverse bar near tip continued out each side to tip, setting off field of seven long setae.

COLOR (in alcohol): Almost exactly as described for *I. cubanus*, differing in details of forewing markings: transverse band before middle not tending to be broken in radial cell; cell Cu_2 with distinct brown spot in middle.

HOLOTYPE ♀: Cuba: Oriente Prov.: Loma del Gato, Sierra Maestra, May 26–28, 1959, M.W.S.

NOTE: A single female with the head missing, from Florida Blanca, Oriente Province, resembles this one closely in external genitalia but differs in several wing marking features. Although it may be a distinct species, I decline to describe it on such poor material.

Indiopsocus ceterus, new species

DIAGNOSIS: See accompanying key.

Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3598	1412	470	—	24	0.46	0.32	0.23	1.43	0.71

MORPHOLOGY: Forewing (fig. 191) as described for *I. alticola*. Terminal abdominal segments—Subgenital plate (fig. 193) much

as in *I. alticola*, differing in having sclerotized strips of distal process much more distinct and receding much further from edge before rejoining it; pigmented basal area broad quadrate region with short arm directed laterally from each side at its anterior end, each arm terminating laterally as quadrate region. Gonapophyses (fig. 194) as in *I. alticola* except glabrous distal lobe of third valvula extending only posteriorly, not medially from setose basal lobe. Ninth sternum (fig. 192) with transverse sclerite more narrow in middle and broader laterally than in *I. alticola*. Epiproct as in figure 195; paraproct as in *I. alticola*.

COLOR (in alcohol): Almost exactly as in *I. cubanus*, differing as follows. V-shaped mark of frons with arms broadened only at their anterior points of contact with postclypeus. Forewing with transverse brown band before middle relatively narrow but complete except for narrow break before vein Cu_2; cell Cu_2 with brown spot in middle. Preclunial abdominal segments each with transverse brown band not continuous ventrally.

HOLOTYPE ♀: Cuba: Oriente Prov.: Mayarí, June, 1967, F.Z.

KEY TO THE CUBAN SPECIES OF INDIOPSOCUS

1. Forewing extensively marked with brown, including submarginal band through cells R_5, M_1, M_2, M_3, and Cu_{1a}. Males with phallosome triangular, posterior apex drawn out into acuminate process ... 2
   Forewings not so extensively marked with brown, lacking submarginal band through cells indicated. Males, where known, with phallosome four-sided ... 4
2. Brown spot in cell M_3 of forewing with large clear center; a distinct brown spot in distal third of cell R_1 and another in distal half of cell R_3 ... 3
   Brown spot in cell M_3 of forewing with small clear center or of uniform color; vague brown spot in distal third of cell R_1 and another in distal half of cell R_3 ... *I. variegatus*, new species
3. Male with basal teeth of ridge of hypandrium not much larger than more distal teeth; posterior margin of shelf over male epiproct not clearly demarcated from rest of shelf. Brown band in cell M_2 of forewing weakly developed ... *I. microvariegatus*, new species
   Male with basal teeth of ridge of hypandrium much larger than more distal teeth; posterior margin of shelf over male epiproct clearly demarcated from rest of shelf. Brown band in cell M_2 well developed ... *I. dentatus*, new species
4. Phallosome with two posteriorly directed processes from its posterior margin. Heavily sclerotized frame of female epiproct setting off large clear area including about distal two-thirds of epiproct ... *I. affinis*, new species

Phallosome (where male known) with only one posteriorly directed process from its posterior margin. Heavily sclerotized frame of female epiproct setting off smaller clear area, including only distal half or less of epiproct, or absent 5

5. Transverse band before middle of forewing reduced to brown border of R_1 in radial cell; anal cell colorless ..... *I. pallidus*, new species

Anal cell at least partially brown in basal third; transverse band before middle of forewing generally traversing radial cell, or at least developed as brown border of R_1 and M in this cell 6

6. No heavily sclerotized frame of female epiproct. Tooth rows of hypandrium continuous, with no breaks ..... *I. cubanus* (Banks)

Heavily sclerotized frame enclosing clear area present on female epiproct. Hypandrium (where male known) without distinct tooth rows or with two large basal teeth in one row isolated from other teeth by spaces 7

7. Pterostigma almost completely brown; transverse brown band before middle in forewing reduced in radial cell to brown borders of veins Rs and M. Male with hypandrial tooth rows and with two large basal teeth in one row separated by spaces from other teeth ..... *I. camagueyensis*, new species

Pterostigma brown at most in distal half; transverse brown band before middle of forewing better developed in radial cell than described above. Males, where known, without distinct hypandrial tooth rows 8

8. Subgenital plate with setae of basal pigmented area reaching base of distal process in middle; poorly defined transverse pigment band across distal process just distad of middle. Distal process of phallosome acuminate apically ..... *I. ubiquitus*, new species

Subgenital plate with bare area before base of distal process; no transverse pigment band across distal process 9

9. Bare area before distal process of subgenital plate narrow, about as wide as arm of basal pigmented area. Distal process of phallosome truncated apically ..... *I. texanus* (Aaron)

Bare area before distal process of subgenital plate wide, about three times width of arm of basal pigmented area. Males unknown 10

10. Third valvula with glabrous distal lobe greatly expanded medially as well as posteriorly from borders of setose basal lobe; pigmentation in glabrous basal region of subgenital plate developed as two broad diverging arms, leaving unpigmented a large anterior triangular area ..... *I. alticola*, new species

Third valvula with glabrous distal lobe expanded only posteriorly, not medially, from borders of setose basal lobe. Pigmentation of glabrous basal region of subgenital plate quadrate, covering almost entire region ..... *I. ceterus*, new species

Trichadenotecnum pardus Badonnel

T. pardus Badonnel, 1955, p. 231.

DIAGNOSIS: Forewing (Badonnel, 1955, fig. 535) marked with scattered small spots but with distinct indication of radial spotting pattern in distal cells. Subgenital plate (Badonnel, 1955, fig. 536) in its dorsal membrane with two regions of slender thickenings arranged as spirals or concentric circles.

The species was described adequately by Badonnel (1955). It was originally described from Angola. Badonnel (1967) recorded it from Madagascar and noted that *T. pardidum* Thornton, from Hong Kong, probably is a synonym. In the American Tropics it is widespread. In addition to the Cuban specimen noted below, I have seen material from Florida, Puerto Rico, Mexico, Trinidad (West Indies), Surinam, and Brazil.

Genitalic preparations were made of seven individuals (three from Florida and one each from Puerto Rico, Mexico, Trinidad, and Brazil). These were compared with published descriptions of *T. pardus* and *T. pardidum*. All have very sparse spinelets on the edge of the third valvula. The circular sclerotizations of the inner membrane of the subgenital plate are in the form of a complexly broken and branched spiral, which can also be interpreted as broken and branched concentric circles. The heaviness of these sclerites varies, perhaps with staining or age. The material is clearly the same form as the African one.

Of the 40 adult specimens on hand, all are females. Badonnel, likewise, had only females from Angola and Madagascar. From these data, parthenogenesis seems likely.

RECORD: Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, 1 ♀, M.W.S.

Ptycta lineata, new species

DIAGNOSIS: Median sclerotized strap of hypandrium very narrow, with fine denticles on right edge. Phallosome with bifid distal process. Preclunial abdominal segments marked with five longitudinal brown bands on creamy white background (a middorsal band and a dorsolateral and lateral to each side).

Male. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
2606	1024	368	100	20	0.20	0.36	0.27	0.56	0.77

MORPHOLOGY: Forewing (fig. 196) with pterostigma of moderate depth with *stigmasaum* from base to posterior apex. Rs and M joined

moderate distance. Free segment of Cu_{1a} before junction with M shorter than joined veins.

Terminal abdominal segments—Hypandrium (figs. 199, 200) with median sclerotized strap curving slightly right from base toward apex. Phallosome (fig. 197) with widened area on each side near base; apex drawn out into slender process bifid near tip, resulting two prongs both acuminate and pointing somewhat leftward. Clunium heavily sclerotized on margin on each side before base of paraproct and adjacent lateral corner of epiproct. Paraproct with long, slender distal process. Epiproct (fig. 198) of two flaps apparently held semi-rigidly at about right angles to each other. Entire structure heavily sclerotized on rim, latter shagreened.

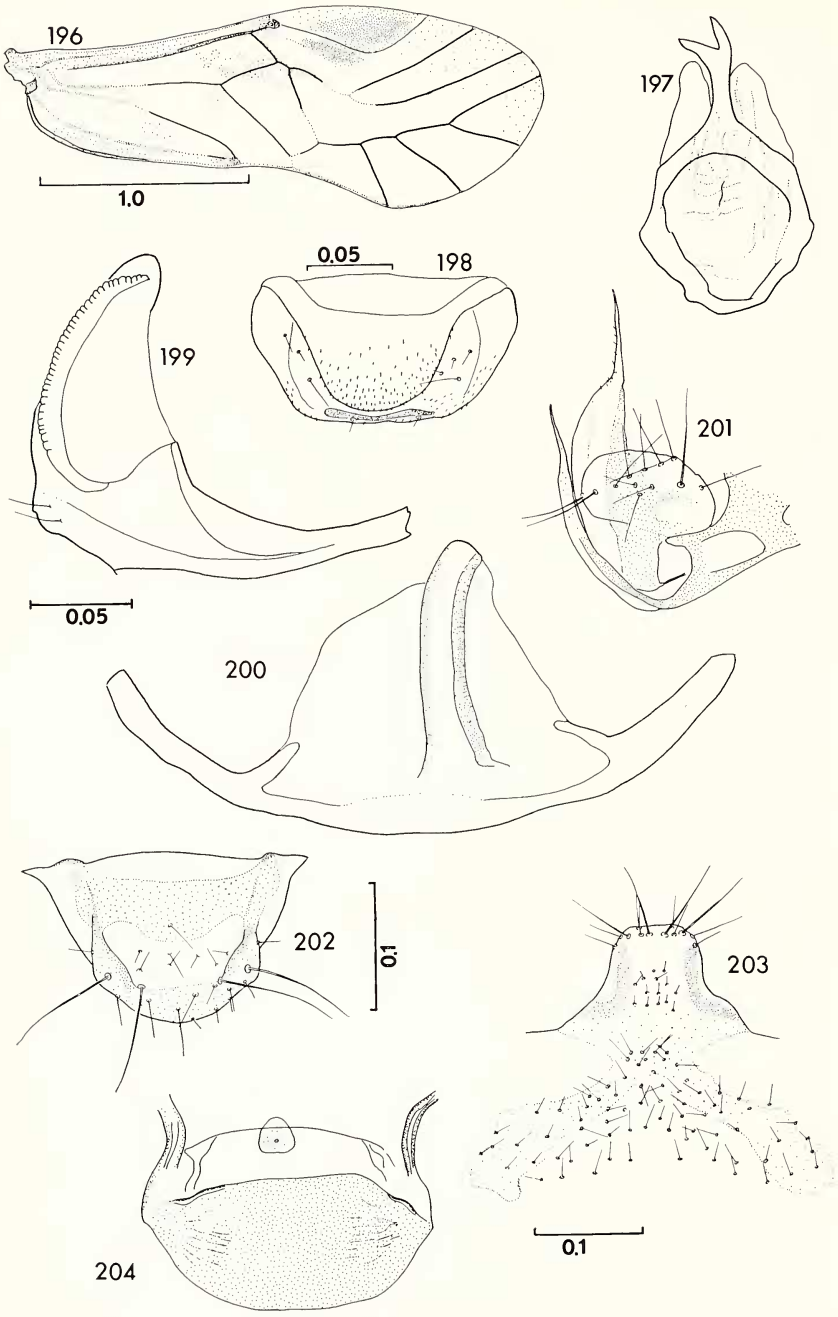
COLOR (in alcohol): Compound eyes black. Body in general pale yellowish brown with darker brown markings. Vertex medium brown along posterior margin, borders of compound eyes and midline, latter stopping just before ocellar interval. Postclypeus with thin dark brown striations in medium brown background forming transverse row centered above middle. Frons with medium brown V-shaped mark in front of ocellar interval. Thorax medium brown, paler along dorsal midline and around wing bases. Legs very pale brown, second tarsomere and distal ring on each femur darker. In forewing (fig. 196) pterostigma and *stigmasaum* brown in their distal two-thirds; free portion of M closing radial cell with brown border continuing on and slightly beyond Rs-M junction. Costal cell pale brown most of its length; faint brown spot distally in radial cell. Faint brown spot posterior to $M\text{-}Cu_1$ separation and another at nodulus. Anal cell pale brown from near base to beyond middle. Forewing otherwise unmarked. Hindwing unmarked. Preclunial abdominal segments as described in diagnosis. Terminal segments pale brown.

Female. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
2471	973	315	108	17	0.34	0.24	0.17	1.42	0.69

MORPHOLOGY: Forewing with minute spur vein from posterior apex of pterostigma; basal segment of vein Cu_{1a} about same length as $M\text{-}Cu_{1a}$ fusion.

Terminal abdominal segments—Subgenital plate (fig. 203) with distal process short, broad, truncated apically, beset at apex with 13 setae, four of them longer than others; field of minute setae in middle of process; toward each edge of process a faint lengthwise band of deeper sclerotization; basal pigmentation forming a Y-shaped area with arms only slightly widened anterolaterally. Gonapophyses (fig.


196
1.0
197
0.05
198
199
0.05
201
200
202
0.1
203
0.1
204

201): first valvula slender throughout, with long, acuminate tip bearing a few minute backward directed spines; second valvula gradually tapering distally toward long, acuminate distal process; third valvula with very short distal lobe, line of long setae across basal lobe and a few scattered setae basad of line. Ninth sternum (fig. 204) with large, elliptical sclerotized plate including spermapore. Paraproct normal for subfamily, with 20–23 trichobothria. Epiproct (fig. 202) semicircular, heavily sclerotized near edges in posterior half, bearing four long setae near posterior margin.

COLOR (in alcohol): As in male except purplish brown spot each side of V-shaped mark on frons; transverse band of striations of postclypeus forming distinct angle with its vertex anterior.

HOLOTYPE ♂: Oriente Prov.: Florida Blanca nr. Alto Songo, May 23–24, 1959, M.W.S.

ALLOTYPE: Pinar del Río Prov.: Aspiro-Rangel, June 16, 1959, M.W.S.

PARATYPE ♀: Habana Prov.: Marianao, Dec., 1964, F.Z.

SUBFAMILY AMPHIGERONTIINAE BADONNEL

Blaste Kolbe

Thornton (1960) has pointed out the tenuousness of the application of this name by Roesler (1944). I have compared all species of Psocidae known to me from northeastern United States with a translation of Kolbe's (1883) description of *Blaste* and *B. juvenilis*, and I find the closest fit to be with '*Psocus*' *quietus* Hagen. This suggests that the name may be correctly applied, but final proof can come only from examination of the type of *B. juvenilis*, if it exists.

In my opinion, the groups that have been assigned as subgenera to *Blaste* (Smithers, 1967 modified by Badonnel, 1967) should be recognized as genera. A large number of American species, including the Cuban species dealt with here, fall into *Blaste* in this restricted sense, and this assemblage will require classification above the species level.

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FIGS. 196–204. Structures of *Ptycta lineata*, new species. Fig. 196. ♂ forewing. Fig. 197. ♂ phallosome, scale of Fig. 202. Fig. 198. ♂ epiproct. Fig. 199. ♂ hypandrium, lateral view. Fig. 200. ♂ hypandrium, ventral view. Fig. 201. ♀ gonapophyses, scale of Fig. 202. Fig. 202. ♀ epiproct. Fig. 203. ♀ subgenital plate. Fig. 204. ♀ ninth sternum, twice scale of Fig. 203.

Blaste immobilis, new species

DIAGNOSIS: Differing from African species *B. angolensis* Badonnel and from Madagascan species *B. vadoni* Badonnel in having median pointed process distally on hypandrium and from Madagascan species *B. poliopterus* Smithers by having median process relatively much longer. Differing from Madagascan species *B. pauliani* Badonnel in details of wing markings. Differing from described North American species in details of male external genitalia.

Male. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3174	1257	368	153	21	0.25	0.29	0.23	0.87	0.81

MORPHOLOGY: Forewing (fig. 205): pterostigma of moderate depth with *stigmasaum* from its base to posterior apex, narrowing distally; Rs and M fused moderate distance; free portion of vein Cu_{1a} before fusion with M shorter than fused portion.

Terminal abdominal segments—Hypandrium (fig. 208) with three well developed terminal prongs, the laterals slender and slightly curving inward, the median decidedly tapering toward tip, tip truncated. Phallosome (fig. 206) of usual form for genus, inner prongs of parameres only slightly outcurved; both prongs acuminate. Posterior margin of clunium heavily sclerotized on each side before base of paraproct and adjacent lateral corner of epiproct. Epiproct semicircular with base heavily sclerotized laterally. Paraproct (fig. 207) with distal prong short and broad.

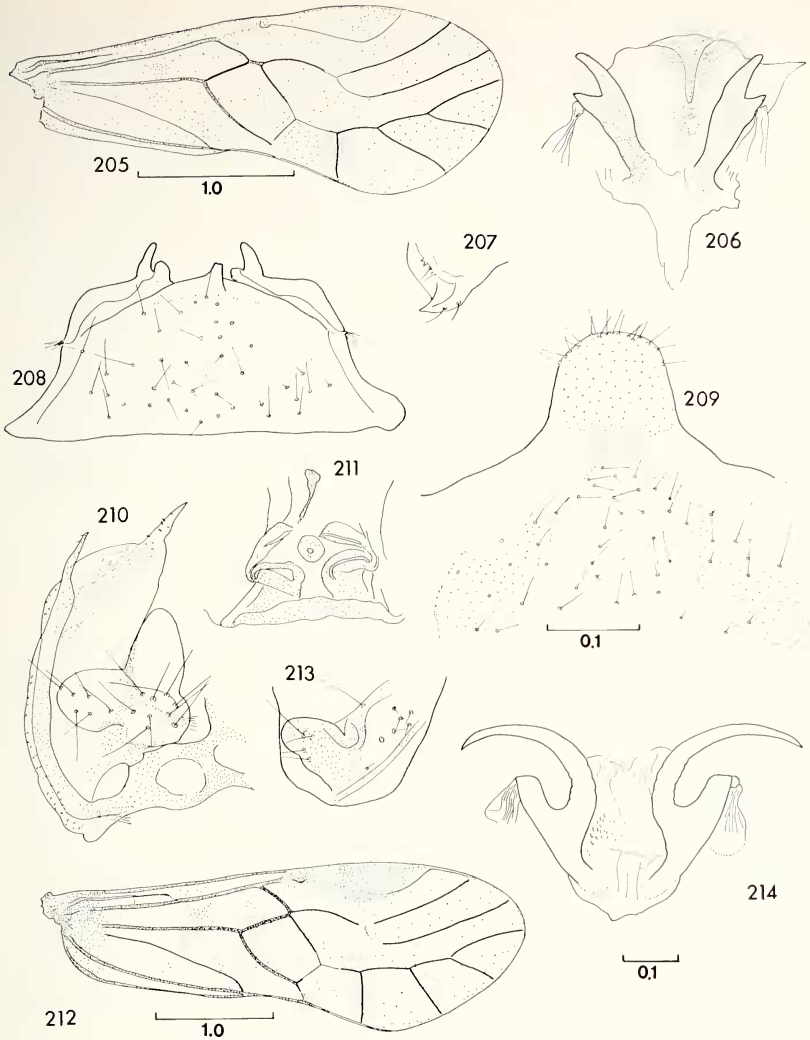
COLOR (in alcohol): Poorly preserved. Compound eyes dark purple. Body and appendages in general pale to medium brown. Head with creamy yellow area in middle of each parietal region and another to each side of ocellar interval. Postclypeal striations indistinct. Forewing (fig. 205) with pterostigma and *stigmasaum* mostly brown; brown spot bordering vein Cu_{1a} distad of its junction with M; brown spot in middle of cell R extending slightly across into cell Cu_1. Forewing otherwise brown-washed or nearly clear. Hindwing unmarked.

Female. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
264	931	244	146	11	0.40	0.17	0.12	2.26	0.68

MORPHOLOGY: Micropterous; forewing directed downward, reaching dorsal articulation of mesocoxa. Hindwing about half length of forewing.

Terminal abdominal segments—Subgenital plate (fig. 209) with



FIGS. 205–214. Structures of Cuban *Blaste*. Figs. 205–211. *B. immobilis*, new species. Fig. 205. ♂ forewing. Fig. 206. ♂ phallosome, twice scale of Fig. 214. Fig. 207. ♂ distal end of paraproct, twice scale of Fig. 214. Fig. 208. ♂ hypandrium, slightly flattened, scale of Fig. 209. Fig. 209. ♀ subgenital plate. Fig. 210. ♀ gonapophyses, twice scale of Fig. 214. Fig. 211. ♀ ninth sternum, twice scale of Fig. 214. Figs. 212–214. *B. capricornuta*, new species ♂. Fig. 212. Forewing. Fig. 213. Distal end of paraproct, twice scale of Fig. 214. Fig. 214. Phallosome.

short distal process beset at apex with short setae; basal pigmented area with slender arms directed anterolaterally, each terminating as diffuse ovoid area. Gonapophyses (fig. 210): first valvula slender, constricting near apex to form acuminate tip bearing a few minute, backward directed spines. Second valvula broad, deeply folded on median surface, with acuminate tip bearing several minute backward directed spines. Third valvula with basal lobe bearing scattered long setae; distal lobe relatively long. Ninth sternum as in figure 211. Paraproct relatively short, bearing stout seta distally in addition to more slender setae; sense cushions with 14–15 trichobothria. Epiproct approximately semicircular, with free edge heavily sclerotized.

COLOR (in alcohol): Poorly preserved. Preclunial abdominal segments largely creamy yellow, marked dorsally by broad brown longitudinal band to each side of midline, becoming more lateral at about half its length; between these two bands, a third brown band from about middle back to clunium. Terminal abdominal segments pale brown to medium brown.

HOLOTYPE ♂, ALLOTYPE ♀, AND 1 ♂ PARATYPE: Oriente Prov.: La Siberia, Sierra Maestra, June, 1967, F.Z.

Blaste capricornuta, new species

DIAGNOSIS: Distinguishable from all other described species by possessing long, horn-like inner prongs of parameres in male and having second valvulae of female capable of swelling bladder-like in distal halves.

Male. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
4181	1673	500	189	25	0.48	0.27	0.24	1.79	0.90

MORPHOLOGY: Forewing (fig. 212): pterostigma shallow, a *stigmasaum*, narrowing distally, from base to widest region of pterostigma. Rs and M joined by short crossvein. Basal free segment of Cu_{1a} shorter than fused M-Cu_{1a}.

Terminal abdominal segments—Hypandrium (figs. 215, 216) distally with three prongs, the laterals incurved and blunt, the median truncated and bearing ridge in middle on its outer face. Phallosome (fig. 214) with lateral prongs of parameres truncated distally; median prongs very long, outcurved, pointed. Posterior margin of clunium convex before base of epiproct, heavily sclerotized before bases of paraprocts and lateral margins of epiproct. Epiproct rounded distally, heavily sclerotized at lateral corners, with small emargination in middle

of base. Paraproct with sense cushion large and central; distal process (fig. 213) very short and broad.

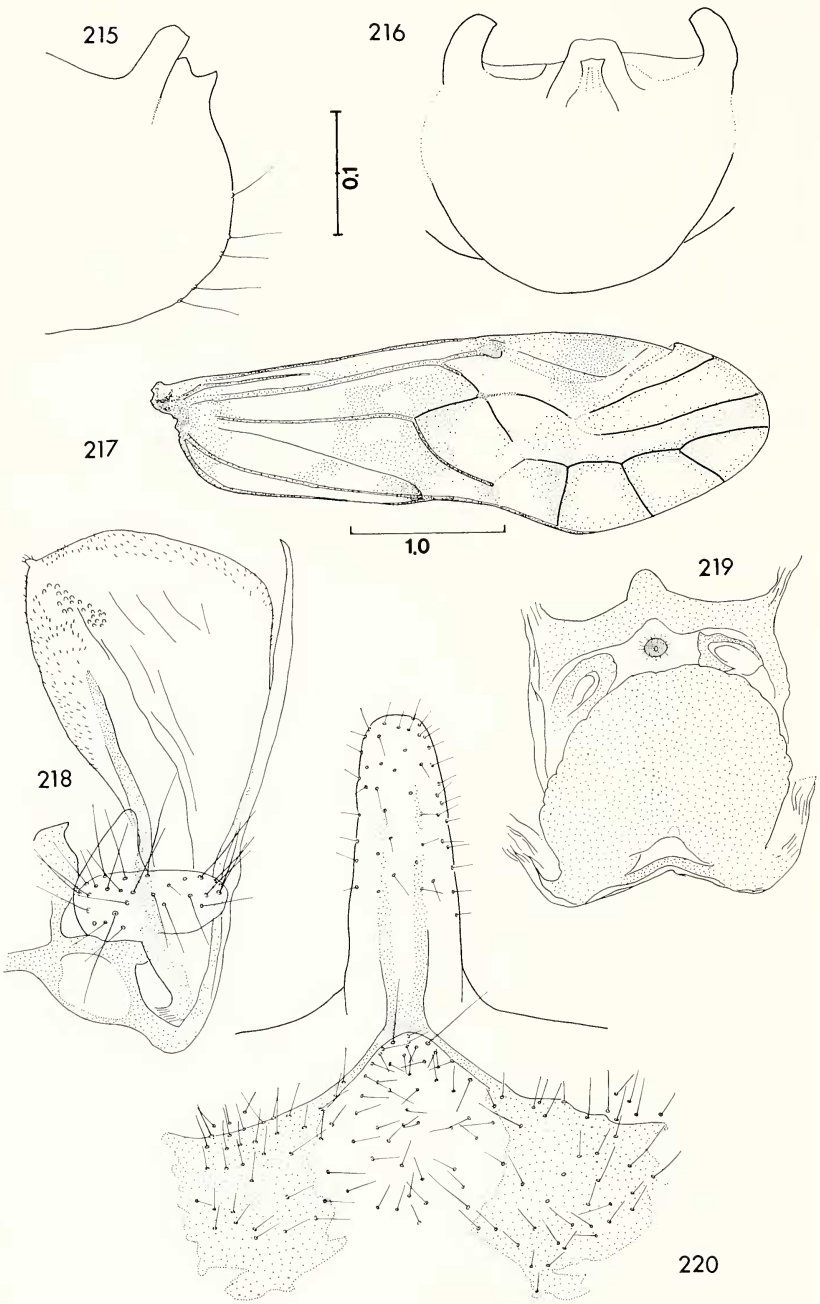
COLOR (in alcohol): Compound eyes black. Body and appendages in general medium to pale brown and creamy yellow, darkest on thoracic tergal lobes. Postclypeal striations vague except median striation in its dorsal half and its two neighbors on each side in their dorsal fourths each emphasized by slender dark brown line. Preclunial abdominal segments with some dark brown subcuticular pigment but its pattern not discernible. Forewing (fig. 212): pterostigma brown except basal third and distal extreme, brown region extending onto *stigmasaum*. Faint brown spot in widest region of cell R_5; veins M_2, M_3, Cu_{1a}, and Cu_{1b} bordered with brown; faint brown spot in distal end of cell R, another in about middle of this cell extending posteriorly into cell Cu_{1b}; faint brown spot bordering vein Cu_1 from its separation from M to about half distance to its branching.

Female. Measurements:

FW	T	t_1	t_2	t_1ct	IO	D	d	IO/D	PO
4033	1852	483	189	22	0.60	0.23	0.18	2.60	0.80

MORPHOLOGY: Forewing as in male but Rs and M joined short distance; basal segment of Cu_{1a} about equal in length to fused M-Cu_{1a} segment.

Terminal abdominal segments—Subgenital plate (fig. 220) with distal process long and slender, truncated apically, beset with sparse short setae along sides and apex; basal pigmented area a pair of slender, heavily sclerotized arms, strongly diverging and each terminating in quadrate area with small, irregular spot appended on its anterior margin. Ninth sternum (fig. 219) with large, semicircular sclerite before spermapore, and sclerotized arch, angled posterolaterally, around spermapore; arch also enclosing circular sclerite to each side of spermapore. Gonapophyses (fig. 218): first valvula long, slightly curved, slender, with a few minute backward directed spines near tip; second valvula capable of great expansion in distal half, expanding region with shagreened surface medially and laterally, and small papillar field dorsally; this valvula bearing distally a short process. Third valvula with basal lobe bearing scattered long setae forming row along its distal margin; distal lobe of third valvula of moderate length. Epiproct with sclerotized knob ventrally on each side toward posterior margin; dorsally with long setae in two lateral fields. Paraproct normal for group; its sense cushion large, with 32–34 trichobothria.


215
216
0.1
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219
220

COLOR (in alcohol): As in male except as follows: vertex of head with distinct pattern of brown and white, brown along posterior margin, each side of dorsal midline, and in broad border around each compound eye; white in middle of each parietal region, extending narrowly to each side of ocellar interval and along frontal line to antennal base. All brown marks of forewing (fig. 217) more distinct. Abdomen with broad dark brown band on each side of dorsal midline from base to middle, and broad band across middle joining the two longitudinal bands.

HOLOTYPE ♂, ALLOTYPE ♀, 2 ♂ AND 1 ♀ PARATYPES AND 2 NYMPHS: Oriente Prov.: La Siberia, Sierra Maestra, June, 1967, F.Z.

Blaste longicauda, new species

DIAGNOSIS: A sibling species with *B. capricornuta*, having male external genitalia essentially identical. Differing principally as follows: 1) smaller size; 2) male clunium with fewer setae in region anterior to epiproct and paraprocts; 3) male compound eyes relatively larger; 4) forewings without brown borders of veins M_2, M_3, Cu_{1a}, and Cu_{1b}.

Male. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3467	1342	424	152	25	0.32	0.32	0.30	1.00	0.94

MORPHOLOGY: Forewing as in *B. capricornuta* but Rs and M fused a short distance.

Terminal abdominal segments—Median prong of hypandrium (fig. 222) slightly indented distally; lateral prongs only very slightly incurved. Paraproct with distal process (fig. 224) somewhat longer than in *B. capricornuta*.

COLOR (in alcohol): Similar to that described for *B. capricornuta*, differing as follows: all postclypeal striations relatively distinct; median striation and its immediate neighbors at their dorsal extremes only very slightly more emphasized. In forewing (fig. 221), veins M_2, M_3, Cu_{1a}, and Cu_{1b} without brown borders except for ex-

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FIGS. 215–220. Structures of *Blaste capricornuta*, new species. Fig. 215. ♂ distal half of hypandrium, lateral view. Fig. 216. ♂ hypandrium, posterior view. Fig. 217. ♀ forewing. Fig. 218. ♀ gonapophyses, half upper scale. Fig. 219. ♀ ninth sternum to upper scale. Fig. 220. ♀ subgenital plate, half upper scale.

tremely faint brown wash along Cu_{1a}. Preclunial abdominal segments marked as described for female of *B. capricornuta.*

Female. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
3457	1440	386	154	24	0.45	0.25	0.17	1.82	0.70

MORPHOLOGY: Forewing as described for male.

Terminal abdominal segments—Subgenital plate (fig. 226) as described for *B. capricornuta* except distal process beset with short setae over its entire surface beyond its basal third; arms of basal pigmented area joined distally to slender, heavily sclerotized midrib, the latter continuing onto distal process and dissipating in base of process; arms anterolaterally each terminating in quadrate area without anterior appended spot. Ninth sternum (fig. 223) essentially as described for *B. capricornuta.* Gonapophyses (fig. 225): similar to those of *B. capricornuta* but first valvula more curved; second valvula apparently not as greatly expandable and with shorter distal process; third valvula with decidedly shorter distal lobe. Sense cushion of paraproct with 27–30 trichobothria. Epiproct as described for *B. capricornuta.*

COLOR (in alcohol): As in male with following differences; postclypeal striations emphasized dorsomedially as described for *B. capricornuta*; brown spot of pterostigma not reaching anterior border.

HOLOTYPE ♂ AND ALLOTYPE ♀: Oriente Prov.: Mayari, June, 1967, F.Z.

PARATYPES: Camagüey Prov.: Monte Imías nr. California, June 7, 1959, 1 ♀, M.W.S. Oriente Prov.: Cupeyal, Yateras, June, 1965, 1 ♀, F.Z.

Blaste fasciata, new species

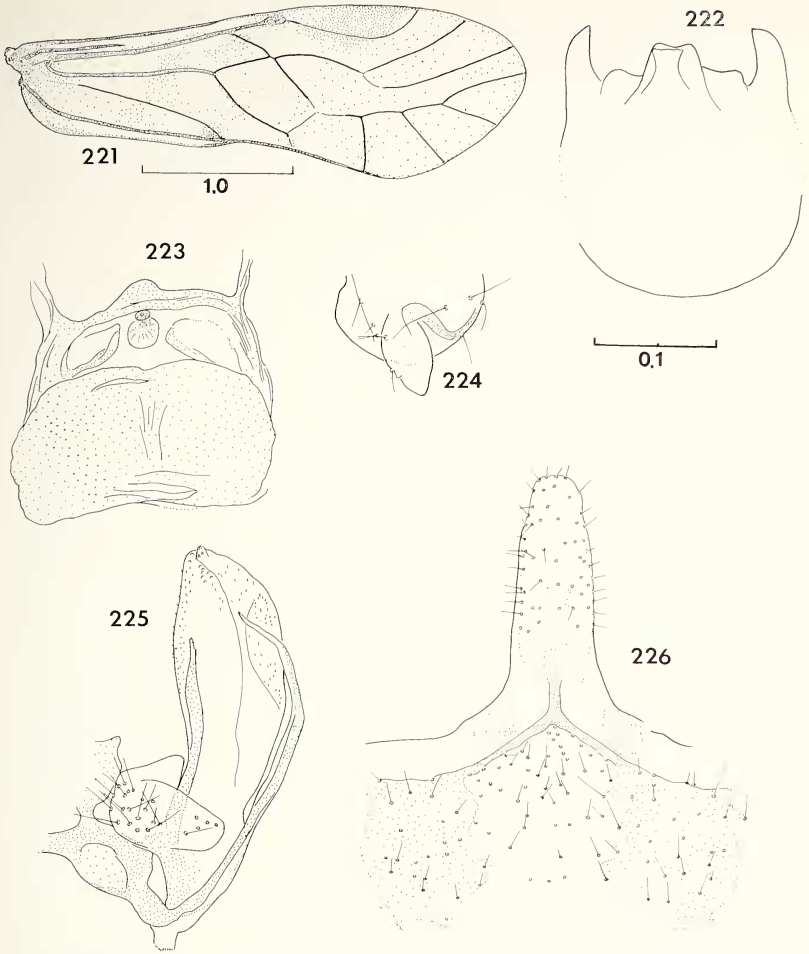
DIAGNOSIS: Very similar to *B. capricornuta*, but differing in having distal process of subgenital plate much shorter; second valvula scarcely, if at all, expandable and bearing long distal process.

Female. Measurements:

FW	T	t_1	t_2	$t_1$ct	IO	D	d	IO/D	PO
4353	1749	435	203	20	0.53	0.27	0.21	2.00	0.79

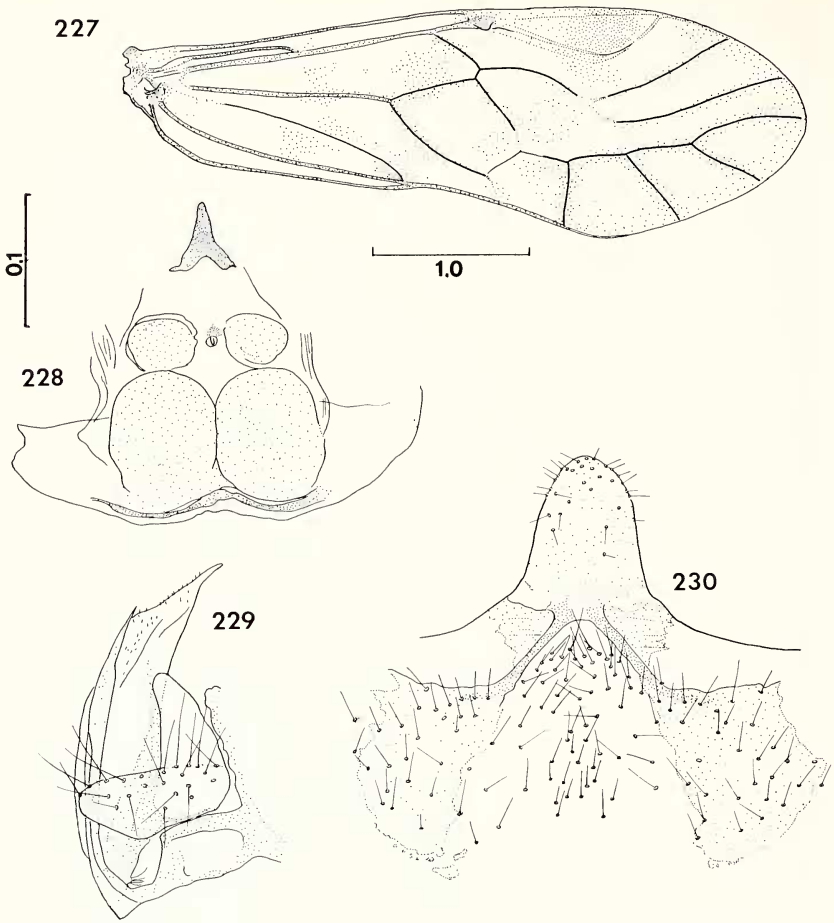
MORPHOLOGY: Forewing (fig. 227): pterostigma of moderate depth, with *stigmasaum* of usual shape for genus. Rs and M joined by crossvein of moderate length; M bowed distally from crossvein to M-Cu_{1a} junction. Free basal segment of Cu_{1a} shorter than fused M-Cu_{1a}.

Terminal abdominal segments—Subgenital plate (fig. 230) with



FIGS. 221–226. Structures of *Blaste longicauda*, new species. Fig. 221. ♂ forewing. Fig. 222. ♂ hypandrium, posterior view. Fig. 223. ♀ ninth sternum, scale of Fig. 222. Fig. 224. ♂ distal end of paraproct, scale of Fig. 222. Fig. 225. ♀ gonapophyses, half scale of Fig. 222. Fig. 226. ♀ subgenital plate, half scale of Fig. 222.

relatively short, posteriorly rounded distal process beset with short setae on and near lateral and distal margins. Basal pigmented area of plate two slender, heavily sclerotized arms diverging anterolaterally and each terminating in quadrate area with small appended spot off anteromedian margin. Ninth sternum (fig. 228) with two circular,



FIGS. 227–230. Structures of *Blaste fasciata*, new species ♀. Figure 227. Forewing. Fig. 228. Ninth sternum. Fig. 229. Gonapophyses, half scale of Fig. 228. Fig. 230. Subgenital plate, half scale of Fig. 228.

well sclerotized plates anterior to spermapore, small, weakly sclerotized circular area to each side of spermapore, and Y-shaped sclerite posterior to spermapore with stem of Y directed posteriorly. Gonapophyses (fig. 229): first valvula narrow, slightly widened in middle, terminating in acuminate point bearing several minute, backward directed spines; second valvula with minute spines on median face and on distal process; third valvula with relatively long distal lobe, basal lobe transverse, with scattered long setae, some forming row along its

posterior margin. Epiproct with pair of heavily sclerotized straps posterolaterally on ventral surface; dorsally with arched band of setae from side to side in distal half. Paraproct normal for genus, sense cushion with 28–32 trichobothria.

COLOR (in alcohol): Compound eyes black. Head largely creamy yellow with medium brown spotting along posterior margin and along epicranial line to ocellar interval. Pale brown area bordering each compound eye mesially; U-shaped mark on frons; postclypeal striations very pale brown. Thoracic tergal lobes dark reddish brown; sutures between them broadly bordered with creamy yellow. Thoracic pleura pale to medium brown; coxae pale brown; remainder of legs white except tarsi medium brown. Forewing (fig. 227): pterostigma brown except basal two-fifths and distal extreme, brown mark extending through *stigmasaum* into cell R_1. Brown spot in cell R near distal end, extending into cell R_1 and discoidal cell; brown spot in middle of cell R continuing into cell Cu_{1b}; brown spot in middle of cell Cu_{1b} and another in this cell bordering vein Cu_1; brown spot at nodulus in cell Cu_2 and another in middle of cell; faint brown border of distal margin of wing from distal end of pterostigma to vein Cu_{1a}; faint brown spot in widest region of cell R_5; brown spot in discoidal cell near its distal end; radial fork veins faintly bordered with brown; Cu_{1a} and entire median beyond Cu_{1a} pronouncedly bordered with brown; remainder of wing clear. Hindwing clear, unmarked. Preclunial abdominal segments largely creamy yellow, with brown pattern as follows: two broad brown bands from base on each side of dorsal midline to about two-thirds length of abdomen; at their extremes, continuing ventrally as broad ring around two segments, and connected dorsally in posterior of these two segments; this posterior connection forming part of median dorsal band from middle of abdomen back to clunium. Sclerotized areas of terminal abdominal segments mostly medium brown.

HOLOTYPE ♀: Oriente Prov.: Turquino, Pico Cuba (Sierra Maestra), June, 1963, F.Z.

KEY TO THE CUBAN SPECIES OF BLASTE

1. Female with wings reduced to small scales. Male forewing with decided darkening along vein Cu_{1a}, otherwise with no outstanding marks ..... *B. immobilis*, new species
   Females with long wings. In both sexes forewing showing pattern of darker and paler areas, always with pterostigma and two spots in cell R darker 2
2. Distal process of subgenital plate twice as long as its basal width. Second valvula long and inflatable 3

Distal process of subgenital plate little longer than its basal width. Second valvula not inflatable ..... *B. fasciata*, new species

3. Transverse compound eye diameter in male about half distance between eyes. Median region of forewing patterned with darker areas bordering veins and paler centers of cells ..... *B. capricornuta*, new species

Transverse compound eye diameter in male about equal to distance between eyes. Median region of forewing uniform in color ..... *B. longicauda*, new species

KEY TO THE SUBFAMILIES AND GENERA OF CUBAN PSOCIDAE

1. Hypandrium generally asymmetrical and limited in its sclerotization to terminal subgenital sternum. Parameres forming closed frame 2

Hypandrium generally symmetrical, its sclerotization including last two subgenital sterna. Parameres free distally ..... Subfamily Amphigerontiinae (single Cuban genus, *Blaste*).

2. Fusion of M and Cu_{1a} short, less than half length of Cu_{1a} from its beginning to fusion. Nymphs without gland hairs ..... Subfamily Cerastipsocinae 3

Fusion of M and Cu_{1a} longer, generally more than half length of Cu_{1a} from its beginning to fusion. Nymphs covered with gland hairs ..... Subfamily Psocinae 4

3. Antennae exceeding length from head to tip of closed forewing. Forewing membrane deep fumose ..... *Cerastipsocus* (single Cuban species, *C. cubanus* Banks).

Antennae less than length from head to tip of closed forewing. Forewing membrane clear ..... *Metylophorus* (single Cuban species undetermined)

4. Forewings marked with series of six spots arranged radially in cells R_1, R_3, R_5, M_1, M_2 and M_3 ..... *Trichadenotecnum* (single Cuban species, *T. pardus* Badonnel)

Forewings without radial spotting pattern 5

5. Forewing generally with transverse color band in basal half. Phallosome broadest basally ..... *Indiopsocus*, new genus

Forewing without transverse color band in basal half. Phallosome broadest in middle ..... *Ptycta* (single Cuban species, *P. lineata*, new species)

KEY TO THE SUBORDERS, GROUPS, AND FAMILIES OF CUBAN PSOCOPTERA

1. Antennae with more than 18 flagellomeres; flagellomeres never secondarily annulated. Tarsi three segmented ..... Suborder Trogiomorpha 3

Antennae with 15 or fewer flagellomeres; if more than 11 flagellomeres present, some or all of them secondarily annulated. Tarsi two or three segmented 2

2. Antennae with 11 flagellomeres, these lacking secondary annulations ..... Suborder Psocomorpha 6

Antennae with 13 to 15 flagellomeres, these with secondary annulations ..... Suborder Troctomorpha 4

3. Wings never totally absent. In short winged forms, venation persistent. In long winged forms, veins Cu_2 and IA of forewing ending together on wing margins ..... Group Psocatropetae (Family Psyllipsocidae, single Cuban species *Psocatropos microps* Enderlein)

Wings long, reduced, or absent. Venation frequently absent in short-winged forms. In long winged forms, veins Cu_2 and IA of forewing ending separately on wing margin ..... Group Atropetae (Family Lepidopsocidae)

4. Wings, when present, never covered with scales; held flat over back when at rest; wings frequently reduced or absent ..... Group Nanopsocetae 5

Wings always present, scaly, never held flat, always slanting, over back in repose ..... Group Amphientometae (Family Amphientomidae, single Cuban genus, *Amphientomum*)

5. Forewings, when present, with venation well developed, including closed cell and several branching veins; mesothorax and metathorax distinctly separate ..... Family Pachytroctidae (single Cuban genus, *Tapinella*)

Forewings, when present, with venation greatly reduced, including no closed cells and only one (the anterior) vein with branch. In all wingless forms, mesothorax and metathorax indistinguishably fused ..... Family Liposcelidae

6. Head in anterior view dorsoventrally as long as or longer than its its width. Labrum internally with two oblique, strongly sclerotized ridges clearly showing through cuticle (fig. 39) ..... Group Epipsocetae (Family Epipsocidae)

Head in anterior view dorsoventrally shorter than its width. Labrum internally on either side with only small sclerotized tubercle between pair of which lies clear semicircular area bordering anterior labral margin 7

7. Pretarsal claws lacking preapical denticles; each claw subtended by broad pulvillus (fig. 51). Abdomen ventrally with two or three transverse blister-like swellings ..... Group Caecilietae 8

Pretarsal claws with or without preapical denticles; pulvillus usually slender or absent; if broad, each claw with preapical denticle. Abdomen ventrally without transverse blister-like swellings 9

8. Forewing with setae on veins of at least basal third of wing nearly upright; setae on R and M-Cu in two ranks ..... Family Amphipsocidae

Forewing with setae on all veins decidedly slanting toward wing tip; setae on R and M-Cu not distinctly in two ranks ..... Family Caeciliidae (single Cuban genus, *Caecilius*)

9. In long winged forms mesothoracic precoxal bridge wider than mesotrochantin at its base. Female paraproct quadrate or hemispherical, without narrower distal lobe ..... Group Homilopsocidea 10

In long winged forms mesothoracic precoxal bridge at its lateral extreme narrower or equal to mesotrochantin at its base. Female paraproct with distal lobe decidedly narrower than basal region ..... Group Psocetae 15

10. Margin of forewing between veins R_{4+5} and Cu_{1a} beset with "crossing hairs," i.e. setae in two ranks, the two ranks oriented differently, so that each seta of one rank is crossed in lateral view by seta of other rank 11

Margin of forewing between veins R_{4+5} and Cu_{1a} without "crossing hairs" 13

11. Tarsi three segmented ..... Family Philotarsidae (single Cuban genus, *Aaroniella*; single Cuban species, *A. achrysa* [Banks])

Tarsi two segmented 12

12. Forewing venation (fig. 73) largely obscure, showing no branching of Rs or M. Forewing densely beset with setae on membranes as well as veins ..... Family Archipsocidae

Forewing venation distinct, always with Rs and M branched. Setae of forewing restricted to veins or their borders ..... Family Pseudocaeciliidae

13. Forewing with vein Cu_{1a} present ..... Family Lachesillidae

Forewing lacking vein Cu_{1a} 14

14. Pterostigma in forewing constricted basally ..... Family Peripsocidae (single Cuban genus, *Peripsocus*)

Pterostigma in forewing not constricted basally .. Family Ectopsocidae

15. Vein Cu_{1a} in forewing joining M by long crossvein ..... Family *Hemipsocidae* (single Cuban genus, *Hemipsocus*)

Vein Cu_{1a} in forewing joining M for short distance, at point, or by very short crossvein 16

16. Tarsi three segmented ..... Family Myopsocidae

Tarsi two segmented ..... Family Psocidae

BIOGEOGRAPHIC SECTION

The Cuban psocid fauna resembles the faunas of other Caribbean islands (these not yet well known), of southern Florida, and of the Gulf Coast of Mexico. There is no generic endemism, both of the genera erected in this paper being known from other parts of the American Tropics. The determined species may be placed in the following biogeographic categories.

I. Endemics and presumed endemics (28 species)

A. With close relatives in the Caribbean islands and/or adjacent mainland (ten species):
Echmepteryx hageni complex species (close relative in Florida Keys), *Amphientomum hystrix*, new species (close relative *A. elongatum* Mockford of Chiapas amber), *Epipsocus ornatus*, new species (close relative *E. icarus* Banks of Hispaniola), *Caecilius pulchellus*, new species (close relatives *C. subflavus* Aaron of southeastern United States and *C. biminiensis* Mockford of Bimini Islands, Bahamas), *Pseudarchipsocus guajiro*, new species (close relative undescribed, in eastern Mexico), *Cerastipsocus cubanus* Banks (close relative *C. venosus* [Burmeister] of eastern United States), *Indiopsocus ubiquitus*, new species (close relative *I. texanus* [Aaron] of Cuba and southeastern United States), *Indiopsocus affinis*, new species (close relative *I. insulanus* [Chapman] of southeastern United States), *Myopsocus clypeofasciatus*, new species (close relative undescribed in Florida), *Phlotodes cubanus*, new species (close relative *P. antillanus*, new species of Cuba, Hispaniola, and Florida).

B. With close relatives outside of Caribbean islands and adjacent mainland (one species):
Ectopsocus pictus, new species (close relatives *E. machadoi* Badonnel of Angola and *E. strauchi* Enderlein of Azores).

C. Region of occurrence of close relatives not known (17 species):
Tapinella aliena (Banks), *Dasydemella dezayasi*, new species, *Graphocaecilius normalis*, new species, *Lachesilla sandersoni*, new species, *Blaste*—four species, *Indiopsocus*—eight species, *Ptycta lineata*, new species.

II. Species occurring on other Caribbean islands and/or adjacent mainland (19 species).

A. Species on other Caribbean islands but not on mainland (two species).
Polypsocus fasciatus Banks (Puerto Rico, Hispaniola), *Caecilius flavibrunneus* Mockford (Bahamas).

B. Species on Floridean, but not Mexican, side of Gulf of Mexico (on other Caribbean islands or not) (nine species):
Embidopsocus laticeps Mockford (Florida), *Caecilius indicator* Mockford (Florida, southern Georgia, Bahamas),

Caecilius tamiami Mockford (southern Florida), *Aaroniella achrysa* (Banks) (Hispaniola, Jamaica, Florida), *Archipsocus floridanus* Mockford (Florida), *Hemipsocus pretiosus* (Banks) (Jamaica, southern Florida), *Indiopsocus texanus* (Aaron) (southeastern United States), *Phlotodes antillanus*, new species (Hispaniola, Florida).

C. Species on Mexican but not Floridean side of Gulf of Mexico (on other Caribbean islands or not) (three species): *Tapinella* sp. (Mexico, Guatemala, British Honduras), *Archipsocus panama* Gurney (southern Mexico, Panama), *Phlotodes minutus*, new species, (Hispaniola, Mexico).

D. Species widespread in tropical and subtropical America, some extending into Temperate Zones (five species): *Thylacella cubana* (Banks) (Florida and Mexico), *Caecilius antillanus* Banks (Virgin Islands, Hispaniola, Jamaica, Surinam, Panama, Mexico, Florida), *Pseudocaecilius citricola* (Ashmead) (Colombia, French Guiana, Puerto Rico, Mexico, southeastern United States), *Cladioneura coriacea* (Roesler) (Brazil, Mexico), *Peripsocus stagnivagus* Chapman (Mexico, southeastern United States).

III. Tropical waifs and cosmopolitan species (13 species):

A. Tropical waifs (ten species): *Proentomum personatum* Badonnel, *Echmepteryx falco* Badonnel, *Psocatropos microps* Enderlein, *Lachesilla aethiopica* Enderlein, *Peripsocus pauliana* Badonnel, *Ectopsocus titschacki* Jentsch, *Ectopsocus maindroni* Badonnel, *Ectopsocus vilhenai* Badonnel, *Trichodenotecnum pardus* Badonnel, *Mesepipsocus mobilis* (Hagen).

B. Cosmopolitan species (three species): *Liposcelis bostrychophilus* Badonnel, *Liposcelis entomophilus* (Enderlein), *Ectopsocopsis cryptomeriae* (Enderlein).

Category I, endemics, contains the largest number of species. Additional study may show that some of these species are not, in fact, restricted to Cuba. On the basis of much material examined from the other Greater Antillean Islands, the Bahamas, Lesser Antilles, Florida, Mexico, Central America, and northern South America, I am confident that most of the species listed above as endemic will remain in that category.

Category I-C, endemic species for which the regions of occurrence of close relatives are not known, will be reduced as the relationships

of the species in this category become established. The four species of *Blaste* and eight of the species of *Indiopsocus* were placed here for convenience. Other species in these genera occur in the Caribbean, but the detailed comparisons necessary to establish the relationships of these with the Cuban species have not yet been made.

In *Blaste* and *Indiopsocus*, some assemblages of closely related species are seen on Cuba which probably formed there. In several genera, isolates on Cuba have diverged from their close relatives on nearby land areas sufficiently so that they can be recognized morphologically as distinct species.

The case of *Ectopsocus pictus*, new species, with close relatives in the mid-Atlantic islands and West Africa, is unique and probably represents a fortuitous long-range dispersal at some unknown time in the past. Alternatively, it may involve a waif which has not yet been detected in its homeland.

Of the species widespread in the Caribbean, very few are restricted to the islands, most of the species occurring also on the mainland. More species are shared between Cuba and Florida than between Cuba and Mexico.

Among the tropical waifs, it is notable that most (all but one) were described from Africa. *Proentomum personatum*, *Lachesilla aethiopica*, and *Trichadenotecnum pardus* (unless *Trichadenotecnum pardidum* Thornton, of Hong Kong, proves to be a synonym of *T. pardus*) have not previously been reported from outside of Africa, although all are widely distributed in the American Tropics. Their introduction from Africa during the slave trade is certainly possible. *Thylacella cubana* is placed as a widespread Tropical American species, but its congeners are all from the Old World Tropics, mostly Africa and Madagascar, and it may prove to be a tropical waif.

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ADDENDUM

After the manuscript of this paper had already undergone final editing, the description of *Spurostigma cuba* Eertmoed came to my attention (Eertmoed, G. E., 1973. The Phenetic Relationships of the Epipsocetae (Psocoptera): the Higher taxa and the species of two new families. Trans. Amer. Ent. Soc. 99:373–414; *S. cuba* p. 404). This brings the number of psocid species known from Cuba to 66 and adds one family. Eertmoed's family name Spurostigmidae should be changed to Spurostigmatidae to conform with Article 29 of the International Code of Zoological Nomenclature (1964). The species belongs in my biogeographic category IA. It goes to couplet 6, Group Epipsocetae in my key to the families, and may be separated from Epipsocidae by presence in *Spurostigma* of vein IIA in the forewing and absence of this vein in the Epipsocids.